

# ROCK PRODUCTS

THE INDUSTRY'S RECOGNIZED AUTHORITY

COPYRIGHT DEPOSIT.

MARCH  
1944

## PLAN FOR POST WAR

Plan now for improvements to increase efficiency (such as savings in critical fuel) and reduce operating costs, to gain ~~greater~~ benefits from the coming post war business.

For 50 years F. L. SMIDTH & CO. have been engineer specialists in designing and equipping plants making cement, lime, etc., and their engineering services apply equally well to complete new plants or any special department, to revisions or conversions.

Engineering now may well bring worth-while returns.

### F. L. SMIDTH & CO.

60 EAST 42ND STREET

ENGINEERS

NEW YORK, N. Y.

MAR 23 1944



# SPEEDS PRODUCTION SAVES COST

Open view of Williams "Slugger"  
Crusher showing heavy duty hammers,  
liners, and discs.

**WILLIAMS  
"SLUGGER"  
CRUSHES  
100 POUND  
STONE TO  $\frac{3}{4}$ "  
IN ONE  
OPERATION**

**T**HE Williams "Slugger" Crusher and Pulverizer now makes it possible to crush large pieces of stone weighing from 75 to 100 pounds to  $\frac{1}{4}$ ",  $\frac{3}{4}$ " or agricultural limestone in ONE OPERATION. This not only eliminates sledging but also does away with the unnecessary expense of a primary crusher.

The "Slugger" represents the most advanced type of equipment on the market today and with seven sizes to choose from, producing from 4 to 30 tons per hour, every producer whether large or small can profitably install a Williams.

## WILLIAMS' FINE GRINDING EQUIPMENT WITH AIR SEPARATION . . .

For faster, more efficient fine grinding of limestone, lime, coal, talc, etc., there is a Williams Roller Mill with Air Separator to fit your requirements. Finenesses from 100 to 400 mesh. Williams also builds Impact Mills with Air Separation, Mechanical Air Separators for classifying finely ground material or taking the fines out of dry material.



**WILLIAMS PATENT CRUSHER  
& PULVERIZER CO.**

800 St. Louis Ave.

St. Louis, Mo.



REG. U.S. PAT. OFF.

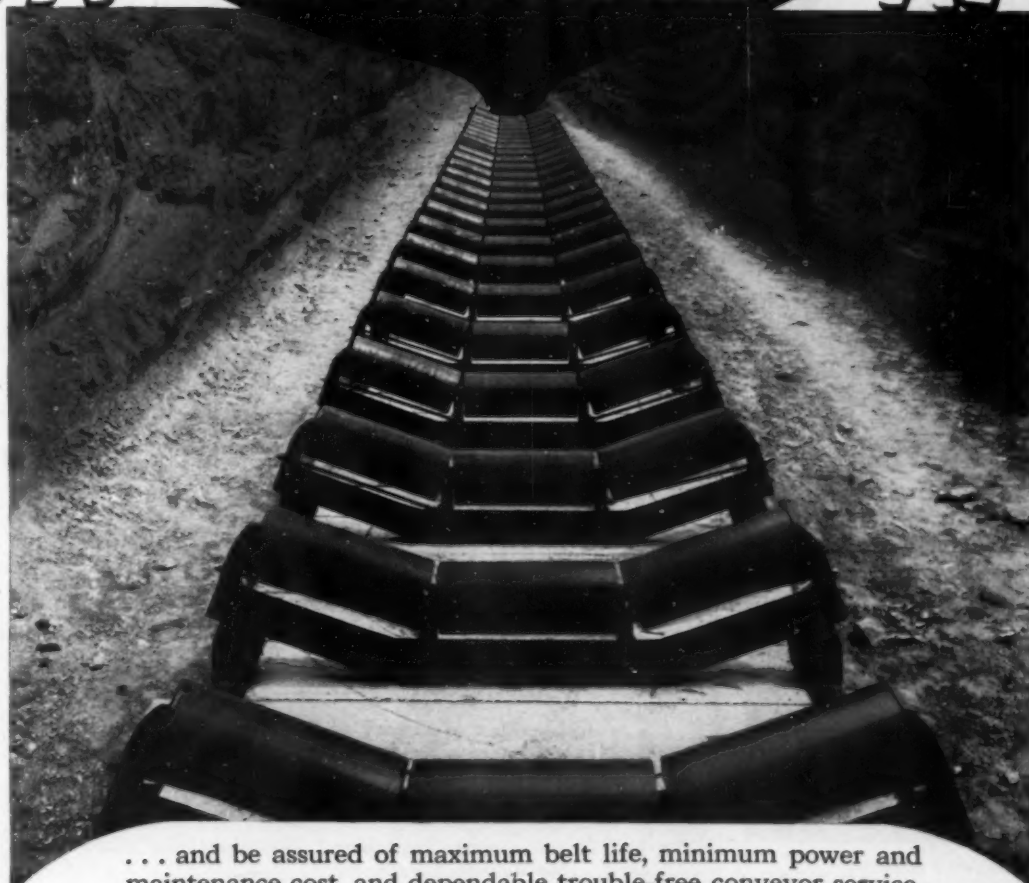
# WILLIAMS

OLDEST AND LARGEST BUILDERS OF HAMMERMILLS IN THE WORLD

# WILLIAMS

**PATENT CRUSHERS GRINDERS SHREDDERS**





... and be assured of maximum belt life, minimum power and maintenance cost, and dependable trouble-free conveyor service. Link-Belt engineers pioneered in the development of anti-friction belt conveyor idlers and have consistently improved the original, fundamental design—the grease seal, bearing adjustment, shaft mounting and the supporting stands and brackets. All with the result that today's Link-Belt designs offer the very best in belt conveyor equipment.

#### LINK-BELT COMPANY

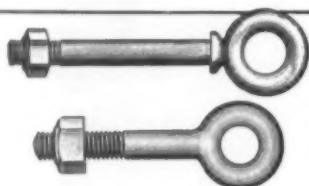
Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Dallas 1, Minneapolis 5, San Francisco 24, Toronto 8.  
Offices, factory branch stores, and distributors in principal cities.

**LINK-BELT**  
BELT CONVEYOR EQUIPMENT  
IDLERS • TRIPPERS • BELTS • PULLEYS • BEARINGS • DRIVES

# HERE'S A LINK FREE FROM PLAY OR SHEARING ACTION ON THE RIVET



Laughlin's drop-forged, heat-treated "Missing Link" is matched under pressure . . . so there is no play between the halves, no shearing action on the rivet. Under stress, the rivet merely holds the missing link together. The interlocking lugs take the load.



## WIDE RANGE OF EYE BOLTS

Laughlin's drop-forged, weldless eye bolts are available in any length or diameter, with or without thread or shoulder. Galvanized or Plain. Stock sizes:  $\frac{1}{4}$ " x 2" to  $1\frac{1}{4}$ " x 20".



## SHACKLES MADE TO U. S. GOVERNMENT TOLERANCES

Drop-forged steel, weldless anchor shackles, made in all sizes from  $\frac{3}{16}$ " to  $2\frac{1}{2}$ ". Can be furnished with either screw pin, round pin or bolt and nut. Galvanized or Plain-finish.

Write for latest Catalog on  
Laughlin Industrial Hardware

Distributed through  
Mill, Mine, and Oil Field Supply Houses

## FORGING A SHARE IN VICTORY

**THE THOMAS LAUGHLIN Company**  
PORTLAND & MAINE

TURNBUCKLE



SHOCK SINKER  
(SHOCK SINKER)



EYE BOLT



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LONDON OFFICE—57 Goldsmith Ave., Acton, London W.3.

# DO YOU KNOW WHAT THIS **BIRD** CAN DO FOR YOU?

This Bird Centrifugal Classifier fits neatly with your present set-up and gives you all of the advantages of closed circuit grinding without disarranging your flow sheet or upsetting the system.

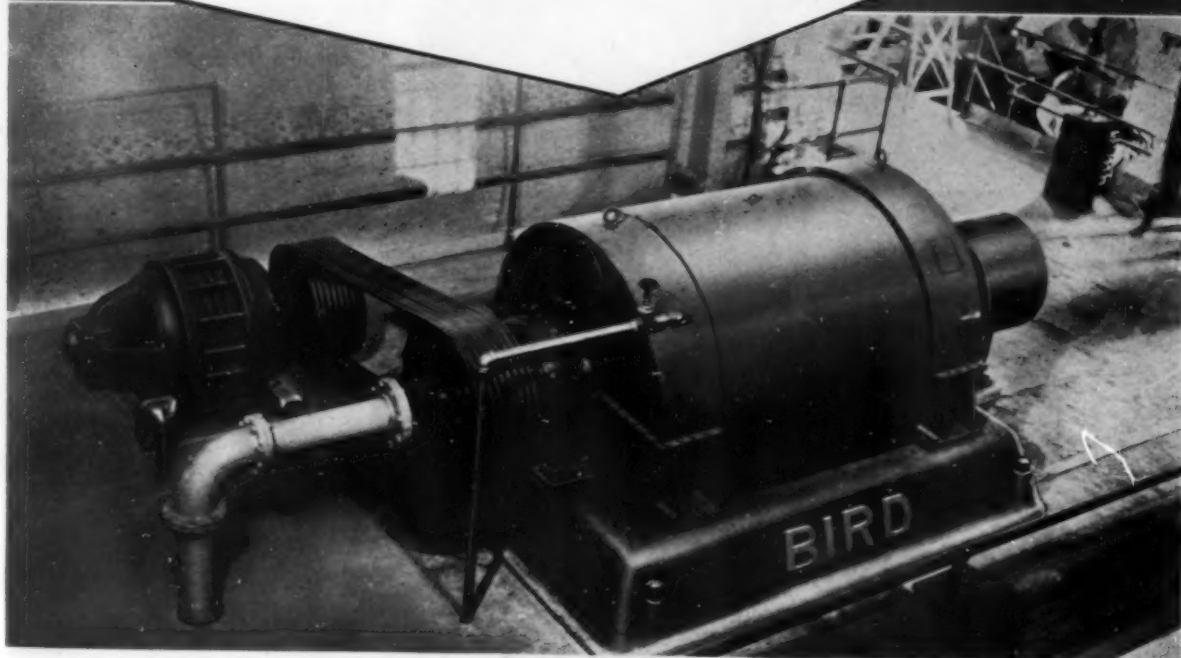
It effects a substantial increase in tube mill production, handles slurry at mill consistency and delivers all of the fines without thickening to the kiln—just right for burning

with top efficiency and minimum fuel consumption . . . It does the whole job automatically and without a hitch day in and day out with insignificant cost of operation and maintenance. It is manufactured in a number of sizes, one of which is just right for your job. It takes minimum floor space. A Bird Classifier capable of handling 5000 barrels a day takes only 13½ x 10 feet.

## NOW IS THE TIME TO FIND OUT

Why wait until the postwar rush to get lined up on this BIRD and just what it can accomplish in your circuit? Let's get together and work out the whole story in terms of *your* production, *your* savings, now. Write

**BIRD MACHINE COMPANY**  
**SOUTH WALPOLE, MASSACHUSETTS**  
*Builders of Bird Continuous Centrifugal Filters*



# LONG LIFE

## BUDA *Low Pressure* DIESEL



The smooth, steady flow of power from a BUDA "Low Pressure" Diesel means more than just good torque characteristics and peak performance . . . it means *longer life* as well. Cushioning the crushing impact of high-pressure combustion, changing the shock of a sharp explosion into a long, smooth power stroke, BUDA Low Pressure design adds years to the life of connecting rods — crankshaft bearings and other engine parts.

### ORDINARY DIESELS

High cylinder pressures produce sledge-hammer blows that punish pistons, rods and crankshaft every power stroke.

### BUDA Low-Pressure DIESELS

Prolonged "low pressure" combustion delivers a smooth, steady power stroke that cuts vibration, saves parts.



Remember . . . BUDA  
powered means BET-  
TER powered—Specify  
BUDA engines on the  
equipment you buy.

# BUDA

HARVEY (Chicago Suburb) ILLINOIS





## Gas attack in an orange grove


*Koroseal is a typical example of B. F. Goodrich development*

**P**OISON gas will kill the California red scale, an insect that attacks trees and fruit, ruining crops. But to kill it, the gas has to be held in some way around each tree. Canvas tents over individual trees were tried. But they weren't gas-tight. Coated fabrics were tried. But they couldn't stand the California sun. They cracked — and leaked.

University researchers asked B. F. Goodrich men for suggestions. B. F. Goodrich had Koroseal, the flexible material made from limestone, coke and salt which had been used as a waterproof fabric coating for shower

curtains, baby pants, and other things. They knew it wouldn't harden and crack, that it wasn't affected by sunlight — or by air, water or most chemicals. A fumigation tent of Koroseal-coated cloth was made. After two years it's still in service, with no sign of cracking or checking. Gas leakage is practically eliminated, resulting in a better kill of the scale with only 1/3 the gas needed for the canvas tent.

Koroseal coatings on umbrellas, raincoats and such things won't get soft and sticky even if they're folded up when wet. As a coating on paper

or as a transparent film it will have hundreds of new uses, and while Koroseal still can't be sold for home use, it's available for many essential industrial uses now. Reasonable amounts can be used for experiment, and we're glad to discuss possible future products, to help make plans or do development work. Write us if you have any problem for which a covering, coating or flexible material might give the answer. *The B. F. Goodrich Company, Industrial Products Division, Akron, Ohio.* 

### **B.F. Goodrich**

**RUBBER and SYNTHETIC products**

**NEAR THE END OF A SHIFT—**

**A DRILLER OUT OF FORGED STEEL**

**WILL HE DO THIS →**



**← OR USE THIS**



**THE NEED FOR THIS DECISION NEED  
NOT ARISE WITH TIMKEN BITS.**



Drillmen being human have the same weaknesses of all human beings. A driller using forged steels packs in no more than the number of steels he thinks he will need to complete a cut. But encountering tough drilling or steel becomes broken or plugged he finds he must stop drilling to search for more steels and carry them to the working face. Nearing the end of his shift, which after all is when shortages occur, his fatigue causes him to become "more human". He may elect to complete the day running dull drills, eventually finishing the round - - - at an enormous loss of efficiency. Even so there's some justification

for his decision. If he must search for steel and pack it to his drill he realizes he will have little time left to sink holes before his shift goes off duty.

Timken Bits prevent these situations from arising. Carrying a few more Timken Bits than the maximum number needed imposes no burden - - - and every driller realizes it's to his advantage to do just that.

This is but one advantage of Timken Bits. We will demonstrate dozens of others. Write for complete details. The Timken Roller Bearing Company, Canton, Ohio.

**TIMKEN**

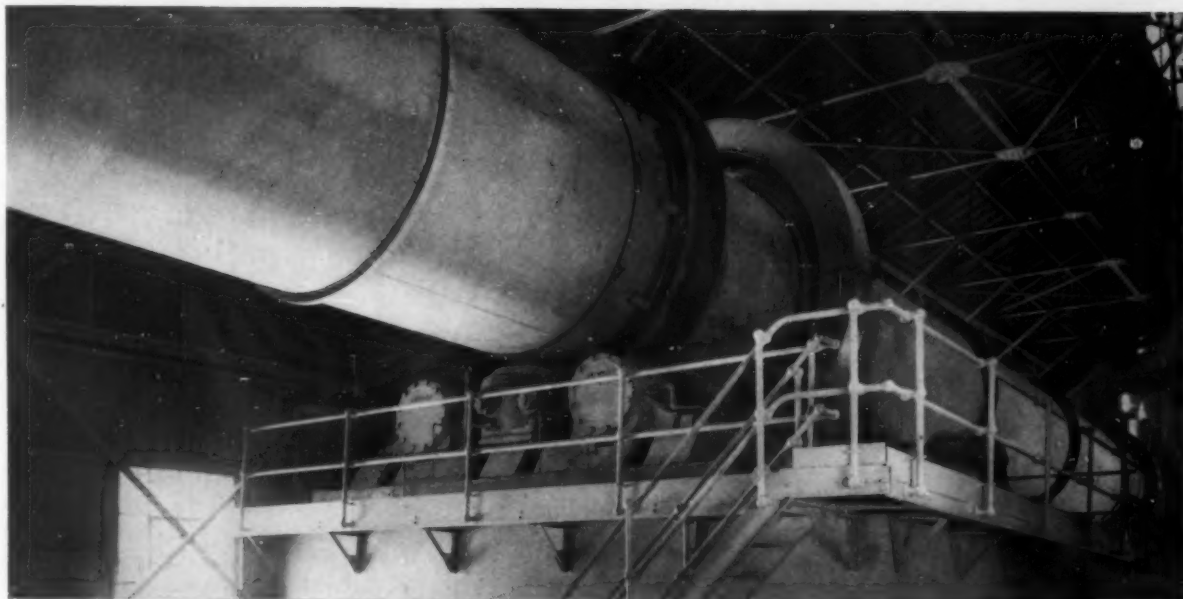
TRADE-MARK REG. U. S. PAT. OFF.

**ROCK BITS**

# TRAYLOR



**KILNS ★ COOLERS ★ DRYERS**



## WE BUILD

Rotary Kilns  
Rotary Coolers  
Rotary Dryers  
Rotary Slakers  
Scrubbers  
Evaporators  
Jaw Crushers  
Gyratory Crushers  
Reduction Crushers  
Crushing Rolls  
Grinding Mills  
Ball Mills  
Rod Mills  
Tube Mills  
Pug Mills  
Wash Mills  
Feeders  
Rotary Screens  
Elevators

## Shells in One Piece!

The shells of ALL Traylor Rotary Kilns, Coolers and Dryers are in ONE PIECE—smooth, straight and generously strong. They're welded, you see, by our original technique which so thoroughly fuses the individual plates that the joints are actually stronger than the parent metal.

By this method of shell construction, taken together with Single Roller Supports (another feature pioneered by Traylor), alignment is easily

secured and permanently maintained. This feature, together with numerous others, based upon our engineers' intimate knowledge of the work to be done, assures minimum unit cost of production. And that, in the final analysis, is what every operator is looking for.

Investigate Traylor Rotary Kilns, Coolers and Dryers—our representative is always available for consultation!

**SEE OUR BULLETIN No. 115**

# TRAYLOR

**ENGINEERING & MANUFACTURING CO.**  
MAIN OFFICE AND WORKS — ALLENTOWN, PENNA., U.S.A.

NEW YORK CITY  
3416 Empire State Bldg.

CHICAGO  
2051 One La Salle St. Bldg.

SALT LAKE CITY  
101 West Second South St.

LOS ANGELES  
919 Chester Williams Bldg.

SPOKANE  
S. 2707 Rhyolite Rd.

B. C. EQUIPMENT CO., LTD.  
551 Howe St., Vancouver, B. C.

Export Department—104 Pearl St., New York City. Foreign Sales Agencies: London, Lima, Rio de Janeiro, Buenos Aires, Santiago, Antofagasta, Oruro, Montevideo

MARCH, 1944



IN OPERATION at a Mid-West quarry, crushing rock for a U.S. Ordnance Plant; set to produce 4" material, and handling rock up to 24", this unit delivered 150 to 175 tons of stone per hour on a 3-shift basis.

The 2540 Primary Breaker is of the overhead eccentric type, with force feed and high operating speed for maximum capacity. Typical A-W heavy duty construction features give assurance of continued high efficiency,

low maintenance cost, and extra years of trouble-free service. Jaws are exceptionally deep to provide faster crushing. Shafts are very large, and are equipped with self-aligning roller bearings which require lubrication only after ten hours of operation.

The 2540 weighs approximately 32,000 pounds and is equally suitable for use in a stationary or portable plant. We shall be glad to tell you all about it.

**AUSTIN-WESTERN COMPANY, AURORA, ILLINOIS, U.S.A.**

BUILDERS OF ROAD MACHINERY

**Austin Western**

SINCE 1859

**BUY MORE  
WAR BONDS**





## A Powerful Influence in War and Peace

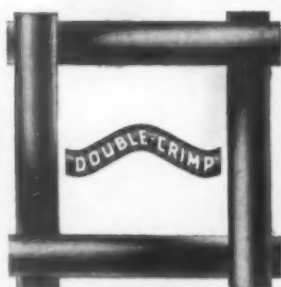
MARION'S PERFORMANCE—its capacity for tremendous yardage when the going is tough—has done much to turn the tide of Victory in our favor. It will do much in rebuilding a better world—in bringing about a higher standard of living—when peace comes. " "

The Marion Steam Shovel Co., Marion, Ohio.

# MARION

SHOVELS • DRAGLINES • CRANES  
CLAMSHELLS • WALKERS  
Gas • Diesel • Electric

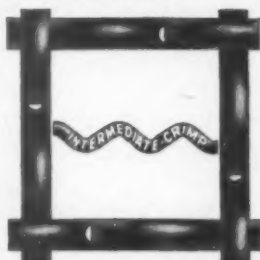




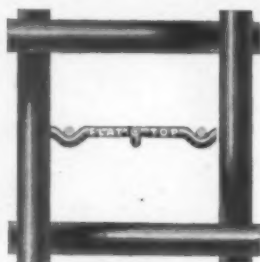
Double-Crimp



Arch-Crimp



Intermediate-Crimp



Flat-Top

#### "Perfect" WEAVES

Arch-Crimp	Rek-Tang
Coiled	Selva-Edge
Double-Crimp	Straight-Warp
Double-Fill	Stranded
Dutch	Sta-Tru
Flat-Top	Triple-Warp
Intermediate-Crimp	Twisted
	Twisted-Fill
	Twisted-Warp

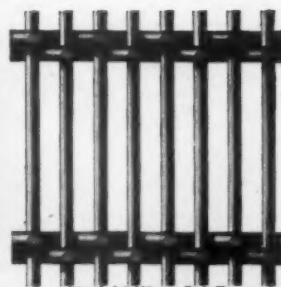
# "The Perfect"

## Wire Cloths and Screens

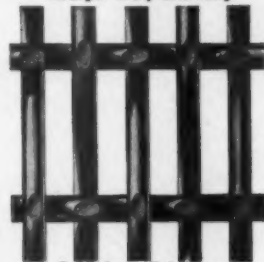
OF  
**SUPER-LOY  
STEEL**

**GALVANIZED STEEL  
STAINLESS STEEL  
NICKEL-CHROME STEEL  
PHOSPHOR BRONZE  
BRASS  
COPPER  
MONEL  
NICKEL  
ALUMINUM**

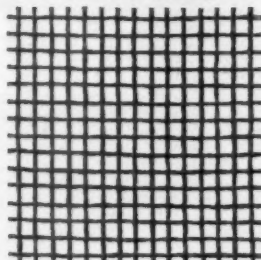
**ANY SPECIAL METAL FOR  
ANY SERVICE**



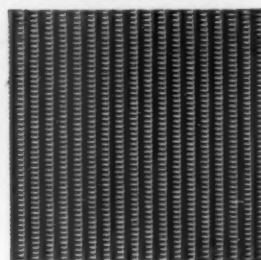
Straight Warp Rek-Tang



Calendered Rek-Tang



Triple Twisted Warp and Fill



Dutch Weave

#### "Perfect" PRODUCTS

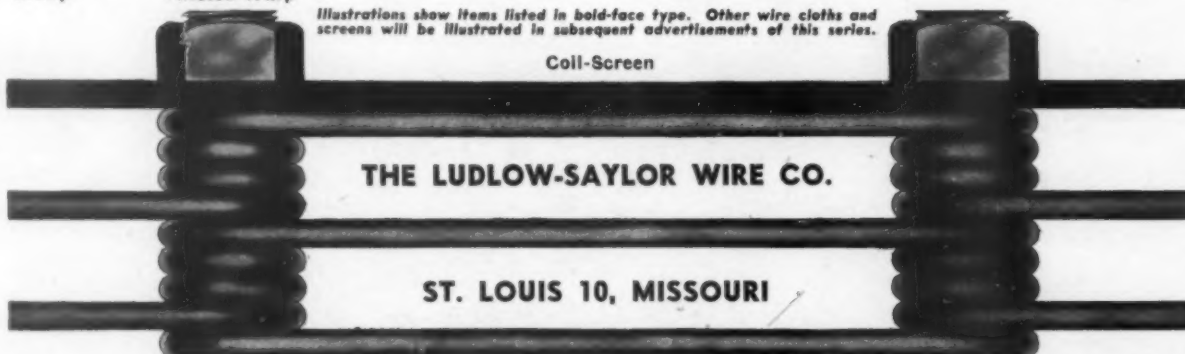
Baskets	Panels
Circles	Pieces
Coils	Ribbons
Cones	Rings
Cylinders	Rolls
Discs	Sections
Forms	Segments
Leaves	Strips
Lengths	Templates

#### "Perfect" PROCESSING

Arc-Welding	Cutting	Galvanizing	Shearing
Bending	Dipping	Jointing	Slitting
Binding	Dishing	Knuckling	Soldering
Brazing	Finishing	Painting	Spot-Welding
Calendering	Flanging	Rolling	Squaring
Coiling	Flattening	Selva-Edge	Stitching
Crimping	Forming	Shaping	Tack Welding
	Framing		Trimming

Illustrations show items listed in bold-face type. Other wire cloths and screens will be illustrated in subsequent advertisements of this series.

Coil-Screen



**THE LUDLOW-SAYLOR WIRE CO.**

**ST. LOUIS 10, MISSOURI**



## ... and WHAT a foxhole !

You're right, soldier, it is a foxhole. Not the kind you dug in Tunisia or Guadalcanal—but just as important in conducting offensive measures against the enemy.

In this kind of foxhole, vast beds of coal and ore are uncovered at depths of 100 feet and more—to permit mining from the surface with modern excavators—to do it faster, with fewer men—without tedious hand methods.

These huge open pits are a tribute to America's mass production methods—to the big electric shovels that dig day and night to feed smelters, blast furnaces, cement mills and other vital industries with the raw materials we need to win.

Yes, they're far behind the lines of actual combat. But you can count on the P&H Electric Shovels to stay in the fight until the last shot has been fired. Then, they'll resume their peacetime jobs to help build the better world of the future.



**HARNISCHFEGER**  
CORPORATION

Overhead Cranes • Electric Hoists  
Excavators • Welding Positioners  
Arc Welders • Welding Electrodes

4410 West National Ave.  
MILWAUKEE 14, WISCONSIN

EXCAVATORS • ELECTRIC CRANES • ARC WELDERS

HOISTS • WELDING ELECTRODES • MOTORS





**LEFT:** 2-Cycle Diesel being taken into Walling's shop for check-up and repairs.

**CENTER:** After several thousand hours of steady service, the HD-7 is shown undergoing the complete overhaul — which included removing the motor and "taking it down" — installing new sleeves, pins and rings, new main bearings, new valves and reseating heads, new filters, new fan belts, new flame heater switch and motor, and overhauling the oil pump-blower and water pump. The left hand final drive was removed and new seals, one track sprocket and rear axle bracket were installed. Steering clutch brakes were re-lined, steering clutches adjusted and batteries recharged. The tracks were adjusted and track bolts installed, where necessary. In addition, the bulldozer was repaired and logging drum tightened. Plenty of work to get done in 3½ days!

**BELOW:** It leaves the shop, ready to perform with the efficiency of a new outfit.

# IT PAID DIVIDENDS

## Proves Worth While To Have Tractor Repaired In Dealer's Shop

Salem Sand & Gravel Co., big-time contractor operator in Salem, Oregon, received a tip that really paid off when they called Walling Tractor & Equipment Corp., Allis-Chalmers dealer at Portland, Ore., for a service man to make adjustments on its 2-Cycle Diesel tractor.

Knowing that the tractor had been run steadily on tough work for several years without an overhaul . . . Walling suggested that it be taken into their up-to-date shops for a complete check-up — where special tractor tools and a skilled crew of mechanics were right on hand. He also suggested that the tractor operator accompany the unit to approve the work and to pitch in and help — thereby cut the time and cost of the job and learn more about the outfit he was running.

This contractor immediately saw the advantages of having the job handled this way and readily agreed. That it paid dividends is shown by the amount of work the tractor required (see center caption) and the short time in which it was accomplished — only 3½ days — regardless of the shortage of manpower and critical materials. Now it's performing like a new unit — paying off for the work done.

It will pay you dividends, too, to have major repairs handled in your A-C dealer's shop. Like Walling Tractor & Equipment Corp., your Allis-Chalmers dealer is fully equipped to help you. Let him put your outfits in A-1 condition . . . get peak performance NOW!



# ALLIS-CHALMERS

TRACTOR DIVISION • MILWAUKEE, U. S. A.



*In the Army it's*

# LOGISTICS



*In Industry it's*

# MATERIAL HANDLING

**Getting the RIGHT Material to the RIGHT Place at the RIGHT Time!**

• In the army the supply lines are ships, trains, trucks and planes. In industry, they are conveyors and elevators, engineered into efficient material handling systems.

The development of such systems is a job at which Stephens-Adamson has specialized for 42 years. This broad design and manufacturing experience is at your service now—to help you secure a system that will assure fast, safe and economical conveying and elevating of any kind of bulk materials. For the solution to your present or anticipated material handling problems, call on S-A.

## STEPHENS-ADAMSON

7 RIDGEWAY AVENUE, AURORA, ILLINOIS

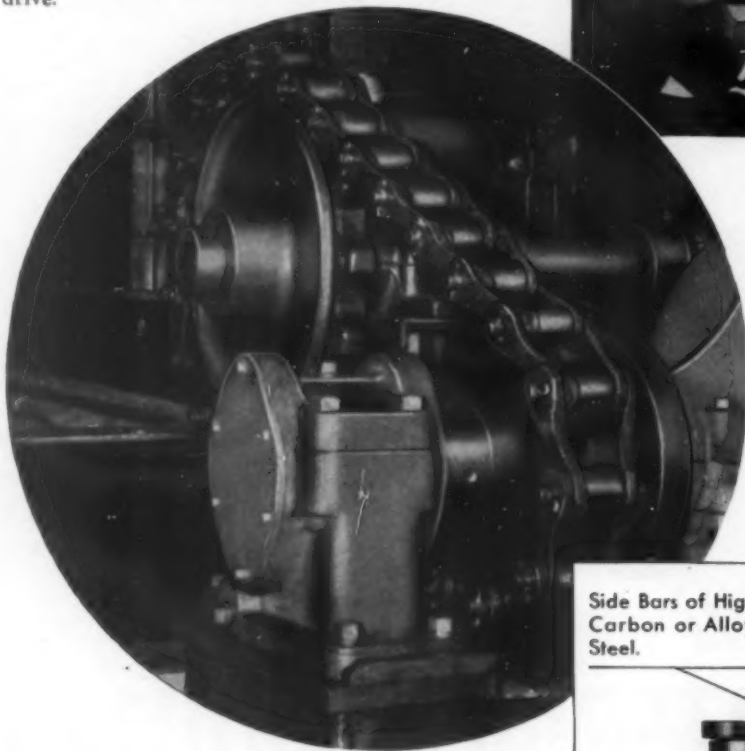
MFG. CO.

LOS ANGELES, CALIF. ★ BELLEVILLE, ONT.

*Designers and Manufacturers of All Types of*  
**BULK MATERIAL HANDLING EQUIPMENT**

# WE CALL THAT OUR PLEASURE DRIVE

① "I STILL HAVE THE JITTERS when I think of that old drive we had," this operator told me. "Always breaking down right in the middle of a big rush job . . . never really operating right, it was the headache of the whole plant. We never got real production till we decided to put in that Chabelco chain belt drive."



③ "LOOK AT THIS DIAGRAM," I told him. "Look at that three-diameter pin with its milled ends that prevent it from turning in the side bars. Note the offset side bar construction, the high finished, case hardened bushings locked in the side bars and the other quality Rex features. It's built tough for tough service. That Rex design means far longer life and greater service."

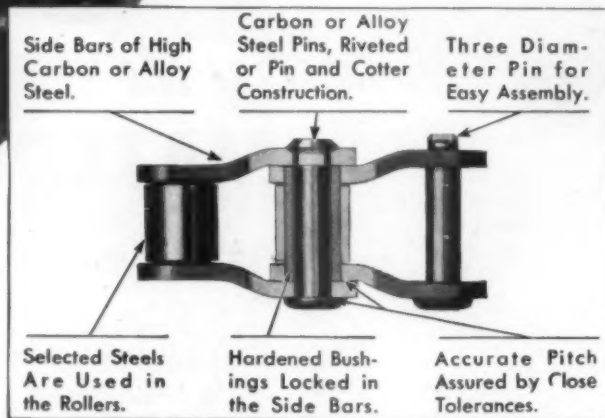
\* \* \*

Rex Chabelco chain belts are the answer to any drive problem where strength and long life are needed. The Rex man can help you with your chain belt application problems. And for engineering data on Rex chain belts, ask for the 768-page catalog No. 444. Chain Belt Company, 1649 W. Bruce Street, Milwaukee 4, Wisconsin.



## ② "DID IT EVER FILL THE BILL!

Why, that chain belt runs so smoothly the boys call it the 'pleasure drive.' And it not only operates better, but it has lasted far longer. Let me tell you, with the conditions under which it operates . . . dusty, dirty, never getting the right attention or lubrication . . . it's a miracle it runs at all. How come that Chabelco chain drive is so good?"



## CHAIN BELTS

More than 2000 sizes and types for the positive transmission of power, timing of operations and conveying of materials

# CHAIN BELT COMPANY OF MILWAUKEE

Rex Conveying and Engineering Products Division, Rex Chain Belt and Transmission Division, Milwaukee, Wis. • Baldwin-Duckworth Chain Belt Division, Springfield, Mass.; Worcester, Mass.



## DYNAMITE IN SLOW MOTION

TRANSLATING THE DETONATION of an explosive into a continuous line . . . and thus charting the exact rate at which pressure is developed is one of the tasks of the recording device pictured above. In effect, it produces a slow-motion picture of an explosion so that its characteristics may be accurately observed.

Through apparatus such as this in one of the most modern laboratories, Hercules technicians study the behavior of explosives of almost every type . . . and thus add to their background of knowledge. It is this wealth of experience—in research, in the field, and in manufacturing—that maintains a constant vigilance over the quality of Hercules explosives, for your benefit and ours.



**HERCULES**  
**EXPLOSIVES**

**HERCULES POWDER COMPANY**  
INCORPORATED

946 King Street  
Wilmington 99 . . . Delaware

129-41

MARCH, 1944

15



## WHY Form-Set Purple Strand is still hard to get

No need to tell wire rope users that wire rope is hard to get.

*You've been telling us!*

But perhaps you'd like to know why, when consumers of some other products are looking toward easing of restrictions, wire rope is still tight. Here are some of the reasons:

The shipbuilding program, with its emphasis on landing craft, will continue to make heavy inroads on wire-rope production. And so, of course, will the year's stepped-up military and naval operations. Further, the country's 1944 oil program contemplates an increase of from 18,000 to 24,000 wells — and for

wells so much deeper than ever before that oil-country demands for wire rope will leap upward from 80 to 100%.

We therefore make this suggestion: Figure your wire rope needs (and place your orders) as far in advance as possible. This offers the best assurance that the wire rope you are going to need through the year will be on hand when you need it.

And while you're thinking about wire rope, think of Form-Set Purple Strand.

"Purple Strand" means that the rope is made of "Improved Plow" steel, the strongest, toughest steel used in wire-rope manufacture.

"Form-Set" means that the wire rope is preformed, making it not only rugged but far easier to handle. Preformed wire rope gives longer service because it is much better able to stand bending fatigue.

Form-Set Purple Strand is Bethlehem's top-quality wire rope. It is made in all sizes and constructions. For the utmost in flexibility and ruggedness, and long service life, call for Form-Set Purple Strand.







## 6 PLACES WHERE HARD-FACING WILL SAVE YOU MONEY!

SEE THOSE SHOVEL TEETH, sheaves, rock drill bits, sprocket teeth, crusher jaws, tractor treads and rollers? All are typical equipment parts that can be made extra-resistant to wear by Coast Metals Hard-Facing.

All that is necessary is to weld the Coast Metals overlay or coating to the steel or iron surface to be protected. Use either the electric arc or the gas torch process. Application is easy, and conforms to simple welding techniques. You can weld Coast Metals alloys to all ferrous metals, including manganese steel, alloy steel, cast iron and chilled iron.

Coast Metals Hard-Facing eliminates the need for frequent repairs or replacements also of pump shell liners, hammers, plows, shafts, bulldozers, extruding screws, pump runners, cement pump screws, paddle washers, rolls, dredge pump or other parts. Our new pamphlet, "How to Make Your Equipment Last Longer" goes into full detail. Write for your free copy today.

### COAST METALS, INC.

Plant and General Offices: 1232 Camden Ave., S.W.  
Canton 6, Ohio

Executive Offices: 2 West 45th Street, New York 19, N.Y.

## WHERE YOU SHOULD USE HARD-FACING

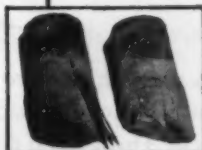
Here, in this informative six-page pamphlet, you will find scores of applications where Coast Metals Hard-Facing makes possible longer equipment life, fewer shut-downs, less idle labor, metal conservation, salvage of worn parts, and peak equipment output! Write for your free copy today!



1. Shovel Teeth 2. Sheaves 3. Rock Drill Bits 4. Sprocket Teeth  
5. Crusher Jaws and Cheek Plates 6. Tractor Treads and Rollers

## Does Your Equipment Give Outstanding Performance

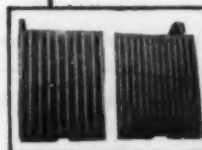
### LIKE THIS?



Spouts Last 30 Days Where 10 Days Had Been Tops. These Coast Metals hard-faced pulverizing mill discharge spouts resist the severe abrasive action of hot clinker mixture that formerly wore out ordinary spouts in less than 10 days!



Trowel Shows Small Surface Wear After Shaping 30,000 Feet of Concrete Pipe. Shaping the bell-end of machine made concrete pipe, this hard-faced revolving trowel withstands grueling abrasion of crushed stone, sharp sand, and cement aggregate, giving over 30 times previous best service.



Crushes 4,900 Tons Where 1,800 Tons Had Been The Limit. Instead of being thrown away, these crusher jaws, when seriously worn, now are hard-faced with wear-resistant Coast Metals. The result is they today crush 4,900 tons of material where formerly, with uncoated standard manganese jaws, 1,800 tons had been the limit.

# COAST METALS

## HARD-FACING WELD RODS

MAKE YOUR EQUIPMENT LAST LONGER

# DRILL

*in any position  
and at any angle*



with the  
**CLEVELAND**  
DR30

Pneumatic tires are now  
unobtainable except for  
armed forces; DR30 Wagon  
Drills are regularly supplied  
with steel wheels only.

★ By merely loosening two nuts, the Cleveland DR30 Wagon Drill can be swung forward or back and from side to side. Then set it as you wish—straight down, flat, breast high, higher than your head, within 4" of ground level, or even straight up. • Here are a few more important features of the DR30:

- ★ Feed capacity over 8 feet, handles depths to over 25 feet.
- ★ Recoil device holds machine to its work, increases drilling speed 10-25%.
- ★ Forward leg point holds the drill and steel in line on all kinds of holes.
- ★ Centralizer keeps steel from "walking" when starting hole, prevents breakage of bit points.

★ Twin jack-screw mechanism permits easy moving of U-bar, shortens set-up time.

★ Main wheels swivel 90° for line drilling, and 180° to obtain narrower tread.

Write for Bulletin 132 that fully describes the most popular wagon drill ever built.

#### BRANCH OFFICES

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#### CANADIAN DISTRIBUTORS

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BUY U. S. WAR BONDS AND STAMPS

## THE CLEVELAND ROCK DRILL COMPANY

Division of The Cleveland Pneumatic Tool Company

CABLE ADDRESS: "ROCKDRILL"

CLEVELAND 5, OHIO.

## LEADERS IN DRILLING EQUIPMENT



*A Complete Line*

## NATIONAL EXPLOSIVES - A

COMPLETE LINE OF EXPLOSIVES FOR CEMENT, LIMESTONE,  
TRAP ROCK, AND THE ENTIRE NON-METALLIC INDUSTRY

THE TABLE SHOWN INDICATES THE PROPERTIES OF NATIONAL DYNAMITES, GELATINS  
AND FLOW-FREE POWDERS

Type	Brand	Weight Strength %	Cartridge Strength %	Avg. No. 1 1/2"x8" Crts. Per 100 Lbs.	Rate of Detona- tion, Ft. Per Sec.	Consistency
Straight Dynamite	Straight Dynamite	15 to 60	15 to 60	208 to 220	7000 to 21000	Cohesive
Straight Gelatin	Straight Gelatin	.....	20 to 100	174 to 204	8500 to 24000*	Very Plastic
Ammonia Dynamite	Standard Dynamite	15 to 60	15 to 60	216 to 220	6500 to 13000	Cohesive
Ammonia Gelatin	Standard Gelatin	.....	30 to 80	180 to 208	8500 to 24500*	Very Plastic
High Ammonia Con- tent, Dynamite	Dolomite 2 to 7	65	48 to 17	240 to 350	11500 to 8800	Cohesive
	Dolomite 2 S to 6 S	65	48 to 21	240 to 330	7900 to 6500	Cohesive
Free Flowing	Flo-Free Bag 1 and 4	15 to 40	.....	8 (12 1/2 lb.) Bag	3900 to 4800	Free-Flowing
High Ammonia Con- tent, Dynamite	Dolomite Bag No. 5 FF	65	.....	8 (12 1/2 lb.) Bag	5000	Free-Flowing
Semi-Gelatin	Tungite 1 and 2	65	56 and 47	220 to 240	13000	Plastic
Special Ammonia Types	Special 2A, B, D, H	61 to 65	15 to 20	290 to 340	5600 to 8950	Cohesive

\*The higher rates of detonation of gelatins occur when 60 % Straight Dynamite primer is used, or when charge is closely confined in bare hole.

NOTE: Straight = Nitroglycerine, Standard = Ammonia.

Millions of pounds of these Explosives are being used annually by the Non-Metallic Trade.



"Not Living on Our Reputation but Building It"

# NATIONAL POWDER COMPANY

ELDRED (McKean County)

PENNSYLVANIA





Model ME-650 Murphy Diesel  
200 Horsepower, 6-cylinder,  
supercharged engine, powering  
a Davenport-Besler locomotive.

**Here's Power to  
Pull Your Load . . .**

## MURPHY-DIESELS

**W**HATEVER your load . . . wherever work calls for heavy-duty power . . . *Murphy Diesels* "take it in stride". . . they tackle the toughest jobs with assurance of *More Power, More Profit.*

These modern Diesels fit your job . . . their compactness, relatively light weight, portability and dependable power can be relied upon, day-in and day-out. They

start easily . . . premium-priced fuels are not needed . . . operating costs are low . . . No unnecessary shut-downs for maintenance . . . simple to operate, and require no specialist to keep them on the job. Their ruggedness gives them longer work-life . . . on either long, continuous operation or intermittent peak-loads, they are equally "willing and able". Write for bulletin.



BUY U.S. WAR BONDS

*More Power*

**MURPHY  
DIESEL**  
Reg. U.S. Pat. Off.

*More Profit*

### MURPHY DIESEL COMPANY

5315 West Burnham Street  
Milwaukee 14, Wis., U.S.A.

*Engines : FROM 90 to 215 HP  
Generators : FROM 60 to 115 KW*

"FIELD-PROVEN POWER"



# "DELIVERING THE GOODS" FOR VICTORY!



2. Chemicals for making Munitions



4. Foods to Civilians here, abroad



1. Supplies to Armed Forces



(Photo Underwood-Stratton)

3. Fertilizer, Feed, to Farmers

Multiwalls, in active service all over the world,  
safely deliver more than 300 commodities  
essential to VICTORY!

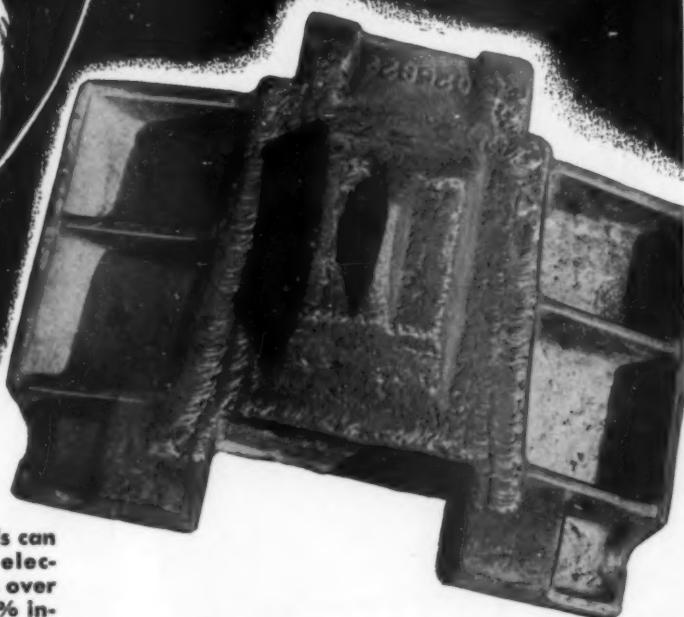


MULTIPLY PROTECTION • MULTIPLY SALEABILITY  
**ST. REGIS PAPER COMPANY**  
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And Offices in Other Principal Cities  
In Canada, Bates Valve Bag Co., Ltd., Montreal, Que., Vancouver, B. C.



**MISTER-FROM HERE  
ON YOU'RE RIDING  
ON VELVET!**



**A**NY set of worn shovel track pads can be reclaimed with ordinary electrodes at considerable savings over new pad cost—and usually with a 100% increase in pad life. But when worn pads are hardfaced with Stody Self-Hardening, you really begin riding on velvet!

First, there's a whale of a difference between wear resistance of Stody Self-Hardening and the best high carbon steel you can buy. One application of Stody Self-Hardening actually outwears two of high carbon!

Second, it takes no more time or material to apply Stody Self-Hardening—and the alloy's original cost over high carbon is negligible compared to results.

And last, you save the down time and cost of one complete overhaul. No wonder we say you're riding on velvet when you use Stody Self-Hardening!

300 lbs. of 3/16" Stody Self-Hardening at 50¢ per lb. f.o.b. Whittier, California, is ample to repair all pads on a 2½ or 3 yard shovel. Next time your shovel is down for repairs use Stody Self-Hardening and watch the difference!



Have you received your copy of Stody Specification Sheets? They illustrate and describe dozens of equipment-saving applications through the use of hardfacing—sent free on request!

**STODY COMPANY**  
1129 SLAUSON AVE., WHITTIER, CALIF.

**STODY HARD-FACING ALLOYS**  
*Retard wear... Save Repair*



## - - - Grinding Cement Clinker in Peru

The illustration above shows a 7-ft. x 24-ft. Vulcan Tube Mill recently furnished to Compania Peruana de Cemento Portland, whose modern plant near Lima, Peru, will contain, when completed, three Vulcan Rotary Kilns, three Vulcan Rotary Coolers, and three Vulcan Tube Mills; together with all usual accessory equipment.

Driven by synchronous motors through magnetic clutches these Vulcan Tube Mills embody the highest possible standards of quality throughout and can be relied upon to give highly efficient service with minimum operating expense. Their Vulcan Chrome-Moly Liners—cast, heat-treated and tempered in our own Steel Foundry—are guaranteed to give "as good" results as any other liners under the same operating conditions but usually last much longer.

Write us regarding present or prospective requirements for any of the equipment here listed. Our experienced engineers and executives will give careful consideration to all information submitted and will make helpful suggestions, whenever possible, without charge or obligation.

ROTARY KILNS, COOLERS AND DRYERS

ROTARY RETORTS, CALCINERS, ETC.  
FEEDERS, ELEVATORS, SCREENS, ETC.

IMPROVED VERTICAL LIME KILNS

QUICK-LIME HYDRATORS

ELECTRIC HOISTS OF MANY TYPES

SHAKING-CHUTE AND CHAIN CONVEYORS

CAST-STEEL SHEAVES AND GEARS

DIESEL AND GASOLINE LOCOMOTIVES

DIESEL-ELECTRIC LOCOMOTIVES

LOAD-CARRYING LARRIES

STEAM LOCOMOTIVES OF ALL MODERN TYPES UP TO 80 TONS IN WEIGHT

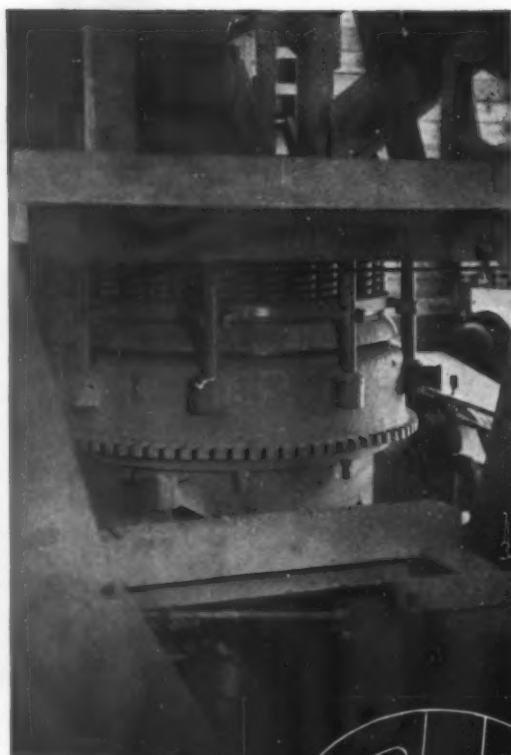


# VULCAN

NEW YORK OFFICE  
50 CHURCH STREET

IRON WORKS  
WILKES-BARRE • PA •



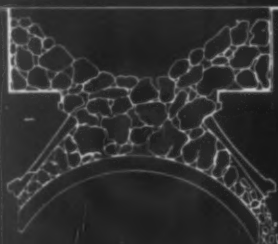


Tel Smith's Gyrasphere Secondary Crusher is made in 34, 36 and 48 inch sizes, with interchangeable crushing cones . . . to meet varying size requirements.



DOUBLE WEDGE ACTION

The Gyrasphere takes an unregulated and unlimited choke feed. That means steady, reliable, economical, effective reduction capacity.



CHOKO FEED

Double protectors . . . four flexible leather labyrinth seals plus two piston rings . . . reduce both oil consumption and maintenance expense to a minimum never attained in any other crusher.



PISTON RING SEALS

# The Only SECONDARY CRUSHER WITH THE Double Wedge CRUSHING ACTION

Working at choke feed, the Tel Smith Gyrasphere Secondary Crusher not only turns out an enormous tonnage of more cubical aggregate, but crushes finer, with less trouble, less power, and less upkeep.

In the Gyrasphere, two forces cooperate to produce the most effective breaking action ever developed in any crushing device. The head is impelled both by the gyrated shaft and a rotary wedge action, produced by the supporting eccentric and roller thrust bearing. The bronze eccentric sleeves are relieved of most of the load—pressures being diverted downward to the massive roller thrust bearings which wear evenly and last indefinitely.

Write for Bulletin Y-11

Y-5

## SMITH ENGINEERING WORKS

508 E. CAPITOL DRIVE, MILWAUKEE 12, WIS.

Cable Addresses: Sengworks, Milwaukee—Concrete, London

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Mines Engineering & Eqt. Co.  
San Francisco 4, Los Angeles 14

G. F. Seeley & Co.  
Toronto, Ont.

# TELSMITH Gyrasphere SECONDARY CRUSHER

# Bemis MULTIWALL PAPER SHIPPING BAGS ...

"SEWN WITH BEMIS SPECIAL THREAD, EH? SAY, THIS BAG IS CLOSED AS TIGHT AS A SCOTCHMAN'S POCKETBOOK"

"IT'S A SWELL ADVERTISEMENT... REGULAR BILLBOARD. AND BEMIS PRINTING MAKES IT STAND OUT ALMOST LIKE NEON LIGHTS"

"BEMIS MAKES ALL TYPES OF MULTI-WALL BAGS - SEWN OR PASTED, VALVE OR OPEN-MOUTH"

"WHEN YOU SEE THE BEMIS BAG-MAKER'S CERTIFICATE, ON A BAG, YOU CAN BET IT EXCEEDS THE CONSOLIDATED FREIGHT CLASSIFICATION REQUIREMENTS. PLENTY TOUGH, SURE 'NOUGH"

"IF YOU NEED A REAL WATERPROOF, MOISTUREPROOF BAG, BEMIS HAS IT"

"BEMIS BAGS ARE TAILOR-MADE TO YOUR REQUIREMENTS"

**CEMENT**

## BEMIS BAGS



**BEMIS BRO. BAG CO.**

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Baltimore • Boston • Brooklyn • Buffalo • Charlotte • Chicago • Denver  
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BETTER BAGS FOR 86 YEARS

**Multiwall Paper, Waterproof Paper Lined, Cotton  
and Burlap Bags for Rock Products**

Design Now for Higher Hourly Production After the War



use  
**ROLLWAY**  
Right-Angle  
**BEARINGS**  
to Carry the Load...

Type MCS  
Double Width

Production rates per man and machine-hour rose sharply after the last war. They'll go higher after this war. That's why postwar machines **MUST** be designed for heavier loads and higher speeds. And that's why the greater load capacity, the longer bearing life, and the lower maintenance costs of Rollway Right-Angle Roller Bearings are vitally important to your postwar designs, right now.

## Rollway Right-Angle Loading Reduces the Unit Load



Right-Angle loading limits the load carried by each bearing to a single, simple load component—*either pure radial or pure thrust*. Thus the unit load per roller is lower, the load capacity for a given dimensional limit is higher. No oblique loads or resultants, no other compound loads can pile up to increase the magnitude of the simple radial or thrust component. Resistance to shock and vibration is increased. Pinch-out of rollers is eliminated—there's less rubbing friction, and less wear-back of roller ends. The net gain is clearly apparent in longer bearing life and lower maintenance cost.

### Standard Sizes for Most Applications

S.A.E. or American Standard metric dimensions and tolerances in a wide range of sizes and types assure low cost and ready availability for most applications. Special designs are rarely necessary. Let our engineers help you select the types best suited to your needs. Just send a drawing or detailed description for free, confidential analysis and recommendation. No obligation.

# ROLLWAY

BEARING COMPANY, INC., SYRACUSE, NEW YORK

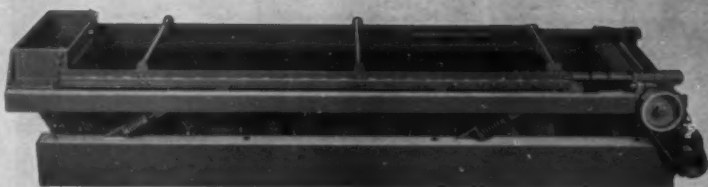
BUILDING HEAVY-DUTY BEARINGS SINCE 1908

# BEARINGS

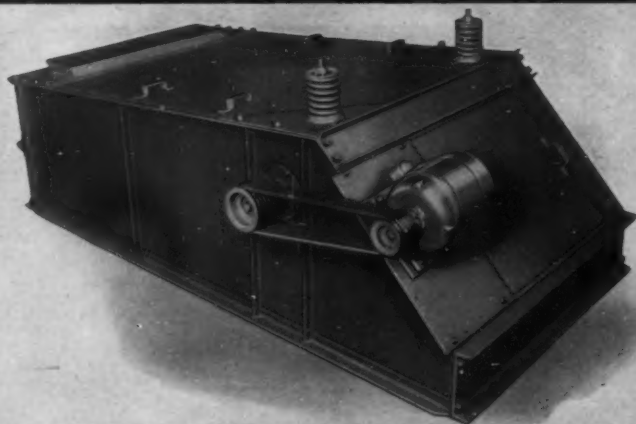


# FOR ALL SCREENING JOBS

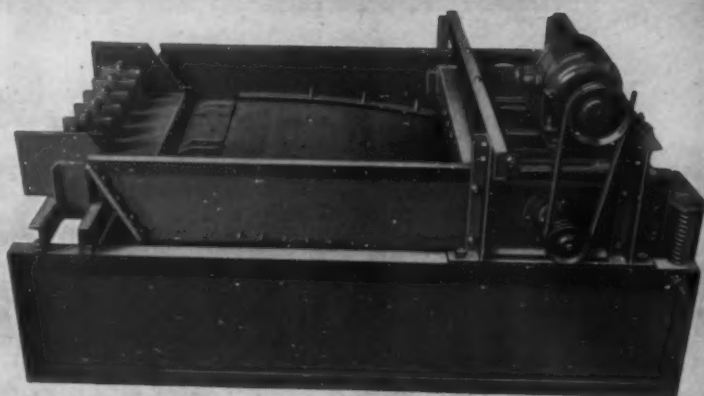
*Coal and Metal Mines, Sand and Gravel Plants, Quarries,  
Paper Mills, Chemical and Industrial Plants*



• The Symons Horizontal Screen is recommended wherever extreme accuracy of sizing is desired. Having the lowest headroom of any screen, it is easily adapted to existing plants. *Bulletin 96*



• The Rod Deck Screen is especially applicable for wet, sticky materials difficult to screen. The patented screening surface consisting of spring steel rods has the advantages of big capacity, long life and low maintenance cost. *Bulletin 94*



• The Hydro-Sizer Screen has its field in fine wet screening of mine pulps, sand, chemicals and oil well mud and similar fine materials. The screening action is such as to permit of extremely efficient separation with a comparatively dry oversize discharge. *Bulletin 111*

*Write for descriptive Bulletins*

**NORDBERG MFG. CO. • MILWAUKEE 7, WIS.**

## SYMONS SCREENS



## FULLER AIR-QUENCHING INCLINED-GRATE COOLER

**FOR  
BETTER AIR QUENCHING  
UNIFORM COOLING  
MAXIMUM RECUPERATION**



**FULLER EQUIPMENT  
FOR THE  
CEMENT INDUSTRY**

FULLER-KINYON CONVEYING SYSTEMS  
FULLER-FLUXO CONVEYING SYSTEM  
THE AIRVEYOR CONVEYING SYSTEM  
ROTARY COMPRESSORS AND VACUUM PUMPS  
AIR-QUENCHING INCLINED-GRATE COOLERS  
DRY PULVERIZED-MATERIAL COOLERS  
ROTARY FEEDERS AND GATE VALVES  
MATERIAL-LEVEL INDICATORS  
SLURRY VALVES  
SAMPLERS

Up to the present, more than 100 Fuller Air-Quenching Inclined-Grate Coolers have been sold, most of which have already been put into successful operation. In fact, of the total number sold, 23 have been repeat orders, proof of the satisfactory performance of the initial installations. These coolers have a daily capacity equal to 135,000 barrels of Portland cement clinker.

The installation of six coolers, shown above, has been in operation two and one-half years and, not one cent has been spent for repair parts on any of these coolers since being installed.

Now is the time to place your order for Fuller Air-Quenching Inclined-Grate Coolers. Our engineering department is in a position to make studies of your requirements and recommend equipment best suited to your needs.

**FULLER COMPANY-CATASAUQUA, PA.**

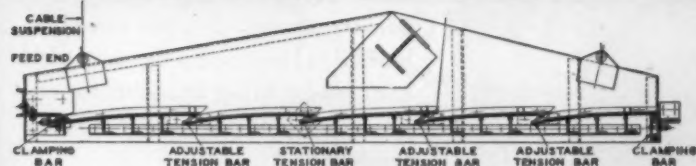
CHICAGO, 3  
Marquette Bldg.

WASHINGTON, 5, D. C.  
Colorado Bldg.

SAN FRANCISCO, 4  
Chancery Bldg.

CO-11

# PRODUCT OF THE MONTH



NEW END-TENSION DECK design of Allis-Chalmers' Low-Head Vibrating Screen employs a feed distributing plate and a series of longitudinally crowned screen surfaces with flat transverse sections. This construction assures uniform depth of product; maximum screen surface utilization. Screen surfaces reversible.



5 by 16 ft. Low-Head Screen with End-Tension Deck to be used as primary screen in Sink-Float plant.

**MILWAUKEE, WIS.**—Allis-Chalmers announces Low-Head Vibrating Screen with new End-Tension Deck developed for wet screening and dewatering. Rubber-covered screen surface supports serve as independent drip strips — assure efficient dewatering operation. Send for Bulletin B-6321.

A 1714

**ALLIS-CHALMERS MILWAUKEE WISCONSIN**

*♪ Tune in the Boston Symphony, Blue Network, Saturday at 8:30 pm, EWT.*

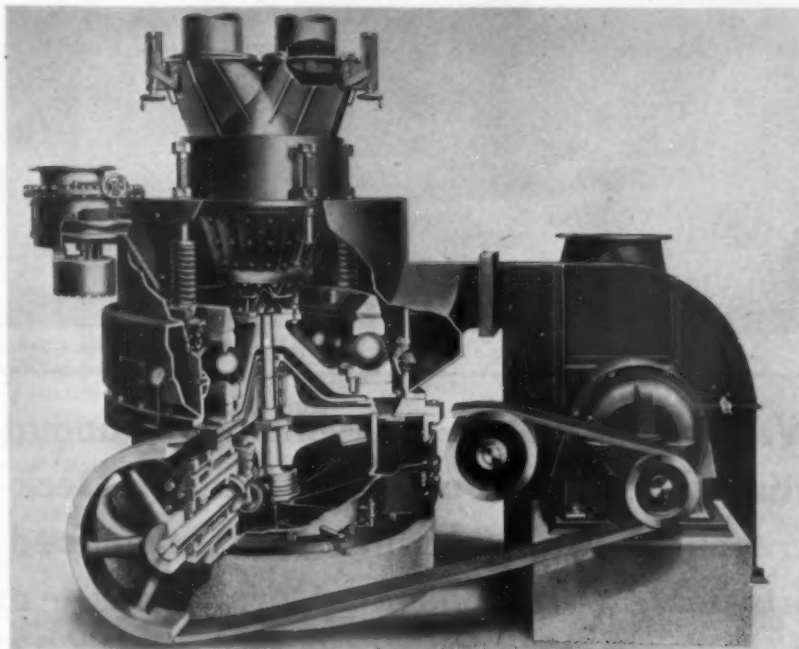


# A FORWARD LOOK

**COAL** stands supreme as the economical fuel for firing cement kilns. About 85 per cent of the cement produced in this country is burned in kilns fired with pulverized coal; direct firing accounts for approximately 40 per cent of the total production.

In post-war days, there will unquestionably be a considerable increase in the use of direct firing equipment. For overall economy, and generally satisfactory performance, the B&W Type E Pulverizer is the logical choice for this purpose.

**THE BABCOCK & WILCOX CO.**  
85 LIBERTY ST., NEW YORK 6, N. Y.



C-56

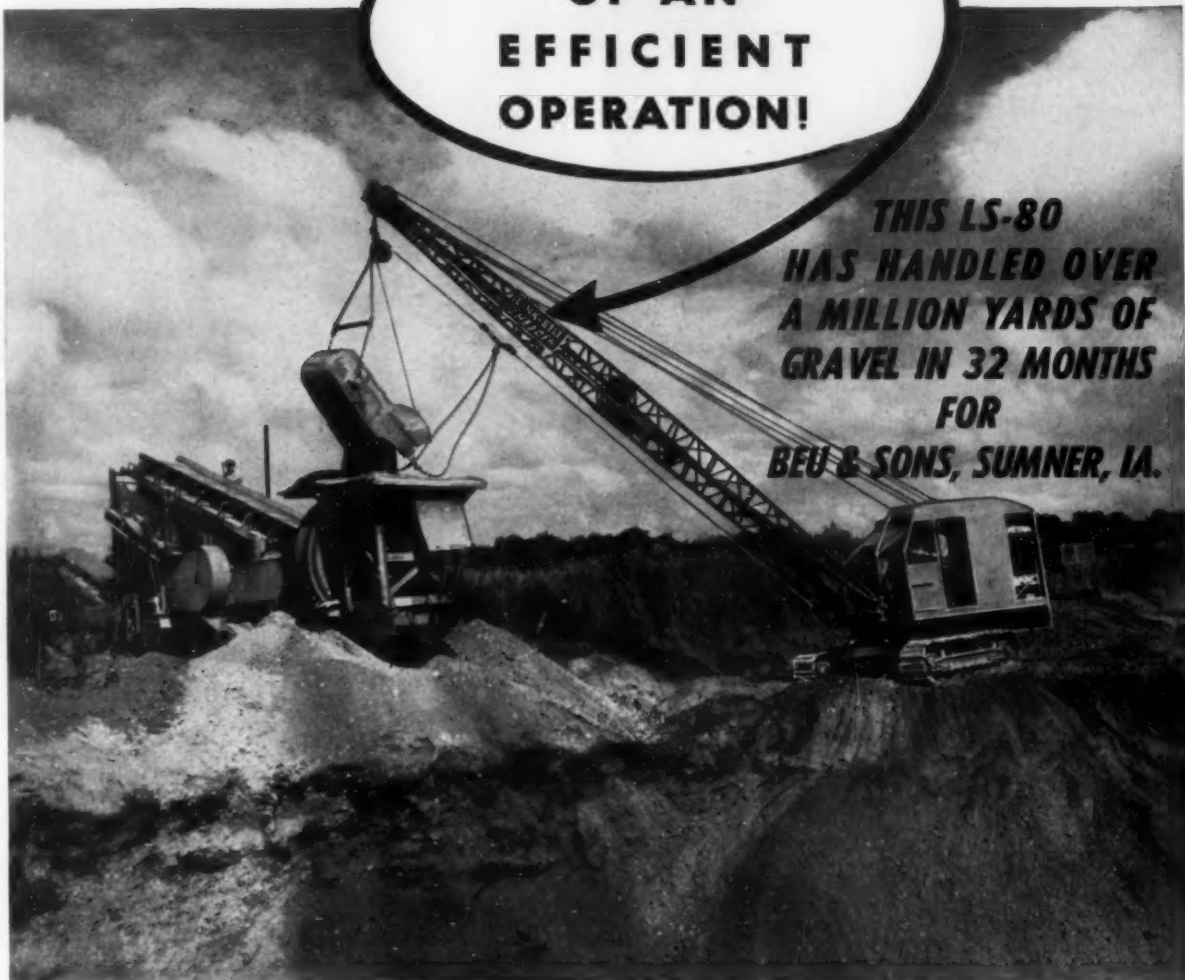
★  
BUY  
MORE  
WAR  
BONDS!  
★

# BABCOCK & WILCOX



**A SURE SIGN  
OF AN  
EFFICIENT  
OPERATION!**

**THIS LS-80  
HAS HANDLED OVER  
A MILLION YARDS OF  
GRAVEL IN 32 MONTHS  
FOR  
BEU & SONS, SUMNER, IA.**

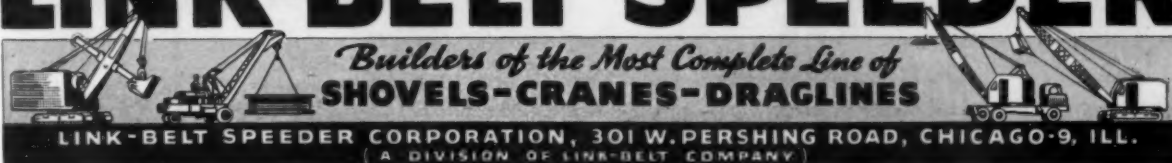


★ BUY BONDS  
AND ★  
MORE BONDS

Contractors all over the United States have found that there is extra profit in the extra strength and stamina built into these finger-tip operated machines. They are engineered for long, maintenance-free service and are giving that service even under the stress of war-time strain. There are 25 different models available—a type and size to fit every job.

# LINK-BELT SPEEDER

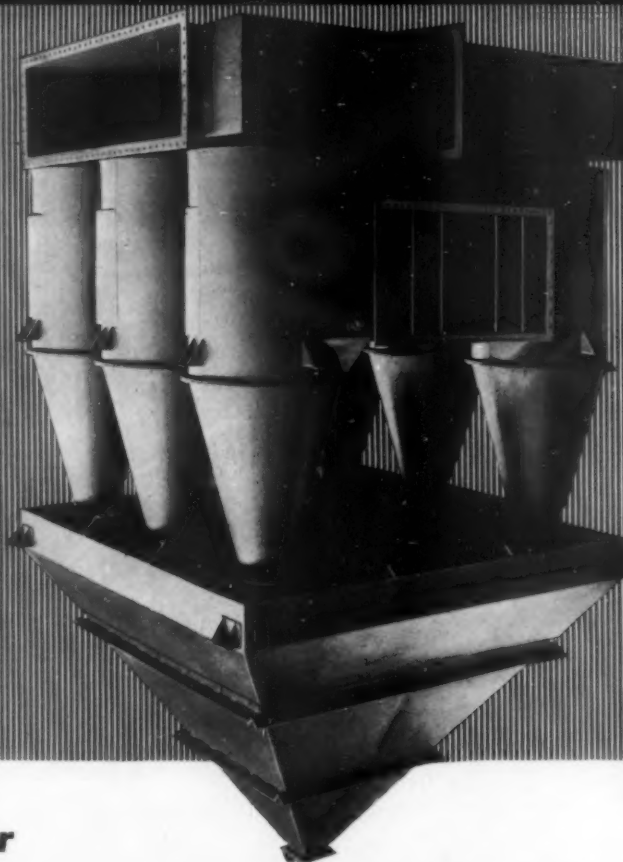
9445



*Builders of the Most Complete Line of*  
**SHOVELS-CRANES-DAGLINES**

LINK-BELT SPEEDER CORPORATION, 301 W. PERSHING ROAD, CHICAGO-9, ILL.  
(A DIVISION OF LINK-BELT COMPANY)

## Next to Large Diameters... EXTRA STURDY CONSTRUCTION



### No. 3 Reason for

### Buell's High Efficiency, Low Maintenance, Long Life

To stand up under the severest conditions of continuous usage, cyclone bodies and cones in Buell Dust Recovery Systems are fabricated of extra-thick steel, rolled and welded into sturdy, one-piece construction to prevent springing of seams under high temperatures; while hoppers are braced and stiffened with 3" channels to resist vibration.

This extra-sturdy construction is possible only with large-diameter cyclones and is one of the plus values that have made Buell Dust Recovery Systems famous throughout industry for long life and low maintenance.

How the patented "shave-off" of the van Tongeren cyclone (found only in Buell Dust Recovery Systems) makes it possible to use large diameters and, at the same time, obtain high collection efficiencies is fully described in a 28-page book: "The van Tongeren System of Industrial Dust Recovery." To secure a copy, simply write us for Bulletin G-842.

BUELL ENGINEERING COMPANY, INC.  
Suite 5000, 2 Cedar Street, New York 5, N. Y.  
*Sales Representatives in Principal Cities*

**buell**  
DUST RECOVERY  
SYSTEMS

BUELL FEATURES	RESULT IN	PRODUCE
SHAVE-OFF	HIGH COLLECTION	GREATER RECOVERY
LARGE DIAMETERS	EFFICIENCY	LOW MAINTENANCE
EXTRA-THICK METAL	LESS FAN BLADE WEAR	LOW OPERATING
LARGE OUTLETS	LOW DRAFT LOSS	COST
INNER WELDS	LOW POWER	LONG LIFE
GROUND SMOOTH	CONSUMPTION	NO CLOGGING
CORRECTLY DESIGNED	HIGH TEMPERATURE	
HOPPERS	RESISTANCE	
SPLIT-DUCT	UNLIMITED CAPACITY	
MANIFOLDS	NO MOVING PARTS	
	FREE DUST FLOW	

DESIGNED TO DO A JOB, NOT JUST TO MEET A "SPEC"

# IT'S A FINE PIECE OF THE PIE

*- if your  
machinery  
is right!*



## Cedarapids

be  
Sure it's

Built  
IOWA

No matter who you talk to — no matter what combination you use, the figures for the future of construction add up to big ones.

All construction begins with aggregate, and considering that a part of the percentage of the "plant and equipment" figure should be included with "aggregate quarrying," over 8% of the highway dollar goes into aggregate production.

Aggregate is basic! Not another machine on the job can turn a wheel until the aggregate is available! Aggregate machinery must be dependable, and must deliver at low cost.

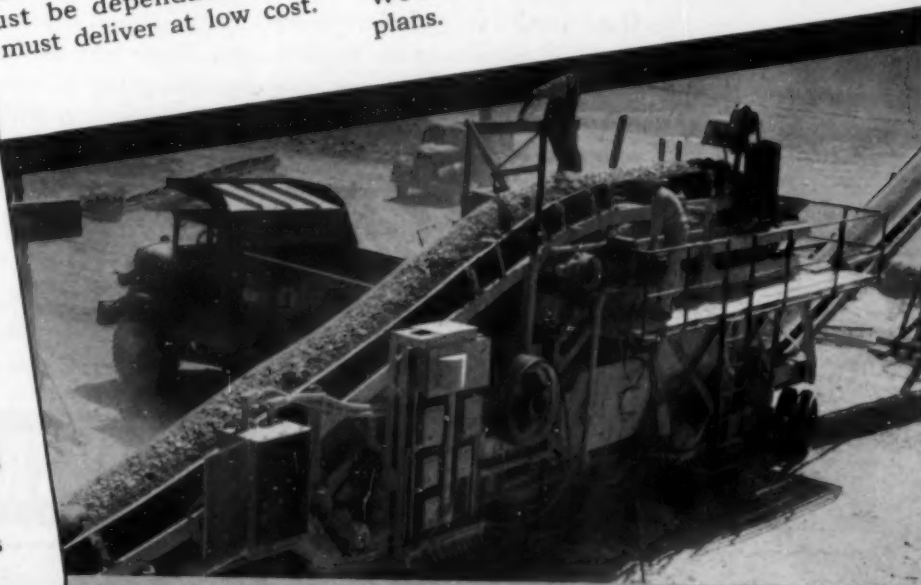
It is machine dependability and high production at low cost that has made Iowa the Headquarters for aggregate producing equipment. Check the names of Iowa owners! Check the output records! Check the number of machines Iowa ships as compared with others! These are the things that prove that big names, big jobs and "Iowa" go together. These are the things that guarantee that Iowa equipment will give you more than you ask on your future contracts.

It is a nice piece of pie, and there will be profit in it if you are Iowa-equipped. We'll be glad to help you with your plans.

### THE IOWA LINE

of Material Handling Equipment  
Includes

- ROCK AND GRAVEL CRUSHERS
- BELT CONVEYORS — STEEL BINS
- BUCKET ELEVATORS
- VIBRATOR AND REVOLVING SCREENS
- STRAIGHT LINE ROCK AND GRAVEL PLANTS
- FEEDERS — TRAPS
- PORTABLE PLACER MACHINES
- PORTABLE POWER CONVEYORS
- PORTABLE STONE PLANTS
- PORTABLE GRAVEL PLANTS
- REDUCTION CRUSHERS
- BATCH TYPE ASPHALT PLANTS
- TRAVELING (ROAD MIX) PLANTS
- DRAG SCRAPER TANKS
- WASHING PLANTS
- TRACTOR-CRUSHER PLANTS
- STEEL TRUCKS AND TRAILERS
- KUBIT IMPACT BREAKERS



IOWA MANUFACTURING CO., CEDAR RAPIDS, IOWA





## LAY-SET *Preformed* IS AT EASE

Putting non-preformed wire rope on your machines is like putting shackles on a policeman. You shouldn't expect a wire rope that is twisted tightly, and under constant tension, to operate well or long.

In Hazard **LAY-SET** Preformed every wire and strand is pre-shaped to the exact curve it assumes in the finished rope. That's why **LAY-SET** is at ease, relaxed, free to work and work willingly. Being free of torsional stress, Hazard **LAY-SET** Preformed lasts longer, gives you greater dollar value. Be sure your next rope is Hazard **LAY-SET** Preformed.

Ever since Pearl Harbor, and even before, Hazard **LAY-SET** Preformed has been saving time and money for the Government, the Armed Forces, and the taxpayer.



**HAZARD WIRE ROPE DIVISION**, Wilkes-Barre, Pa., Atlanta, Chicago, Denver, Fort Worth, Los Angeles, New York, Philadelphia, Pittsburgh, Portland, Tacoma, San Francisco  
**AMERICAN CHAIN & CABLE COMPANY, INC.** • BRIDGEPORT • CONNECTICUT



# HAZARD **LAY-SET** *Preformed* WIRE ROPE



# ROCK PRODUCTS

## PLANNING POST-WAR PLANTS

**T**HE KEYNOTE ADDRESSES at the 1944 conventions of the aggregates industries in New York and the concrete masonry industry in Chicago stressed the urgency of bringing to the blueprint stage plans for public works projects that will provide gainful employment immediately after the war is won.

The planning *now* of really necessary construction projects, permanent in character, such as roads and streets, waterworks, sewage treatment facilities, municipal buildings and residential building, will take up much of the slack while industry re-converts to a civilian economy. But producers of rock products and concrete products should also be planning to prepare their production facilities to handle post-war demands, and it was evident at the conventions that they are.

Currently, there is a lull in activities, with the completion of much Government building, that permits producers time to view their operations in retrospect and to plan for improvements engineered to step up production efficiency. Many ideas and suggestions brought out in the scheduled sessions on operating problems and specifications convinced us that producers are planning better, but not larger, post-war operations. And it was also apparent that post-war specifications will probably be as tough to meet as they ever were.

Unprecedented production for many producers, sustained over a period of several years, has subjected plants and machinery to the acid test. During that period many plants practically underwent a "life expectancy test" that was bound to bring out any "bugs" and weaknesses in their designs. Thus, the war period has been of indirect benefit to operating men.

Without doubt, much has been learned in regard to the performance of individual units of machinery. There is no better test of machinery than in the field and the machinery manufacturer stands to derive real operating information from the past few years' experiences of his customers that will benefit him. The end result will be improved machines that should be reflected in more efficient plants.

In pre-war years, with replacement parts and machinery plentiful and available to all, there wasn't the incentive, perhaps, to check minutely into performance of plant and machinery. Maximum service often wasn't realized as a result. We believe that superintendents and other operating men have become better operating men as a result of their experiences in producing for war construction.

The superintendent of a crushed limestone plant, at the National Crushed Stone Association convention, told how he utilized recording thermometers and ammeters on tube mills and crushers so that he could detect lubrication failure and guard against overloads. He also told of the use of recording clocks to determine the life of manganese steel liners in grinding mills.

This superintendent is attempting to prevent premature machinery failure and is compiling some data on liner life for grinding mills, that will be useful in his post-war operations. The practices he described are not entirely new but they could probably be utilized to good advantage in many operations.

At the concrete masonry convention (reported in this issue), a group of Detroit concrete block manufacturers conducted a symposium on plant layout and production methods. They had previously discussed among themselves and with manufacturers of equipment the shortcomings in their plants, and came out with a proposed design for an "ideal" post-war plant of 5000-unit daily capacity.

It was brought out in the discussion, as a serious weakness in existing plants, that high capacity, vibrating-type block machines almost invariably had been literally "stuck" into plants totally inadequate to accommodate them. As additions were made later, even with mass production methods of operation which should lead to lower unit costs, the point was reached by some plants where the cost curve actually reversed itself and started upward again. Roundabout handling methods and bottlenecks in the flow of materials were taking their toll in increased costs. Many aggregates plants have likewise had to be operated under cramped conditions because future additions could not be, or were not, foreseen when the plants were built.

Rock Products has always advocated diversification of products. The disadvantage of having only one customer, we believe, has been forcibly impressed upon many producers, with the cessation of much Government construction. We would expect the post-war plant to be more flexible, in the interests of greater diversification, as a result.

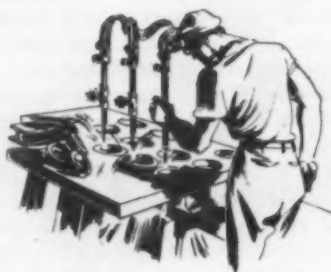
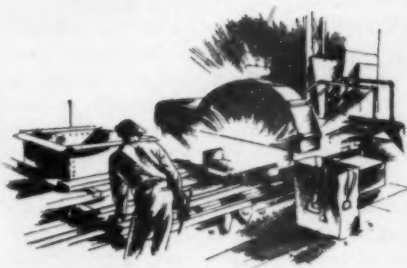
Our own post-war survey to determine the extent of equipment purchases and the types of capital investments to be made after the war bears out these trends. The industry according to its own estimates will invest \$100,000,000 in machinery and equipment the first year after the war.

Forty-five percent of the 400 producers who so kindly answered our questions indicated that they would purchase conveyors. Conveyor installations are significant since their installation usually means considerable revision of flow sheets. Thirty-one percent of the sand and gravel concerns reporting stated they are planning the installation of concrete products machinery, which substantiates that there will be more diversification.

*Bror Nordberg*

# Can Ryerson Steel-Service Help You?

**Steel Cut to Close Tolerance.** Experienced crews working with modern high-speed friction saws, giant shears, powerful hack saws and other metal-working machinery can turn out steel quickly—cut, formed or otherwise prepared to your requirements. Steel that is cut to exact size and specification eliminates scrap and frees your man-hours for more production.



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**Metallurgical Help For Steel Problems.** Our staff of engineers and metallurgists are experienced in serving customers in every branch of industry. These men have displayed a genius for solving problems pertaining to steel application, heat treating and fabrication. Theirs is the practical type of *know-how* and you can depend on them to work with you whenever a difficulty arises.



**Speedy Delivery Without An Expediter.** Every man and woman in our eleven strategically-located plants knows the meaning of the word *rush*! The Ryerson organization is geared to getting your steel delivered in the shortest possible time. Write for your copy of the Ryerson Stock List—complete catalog of steels in stock for immediate shipment including: bars, shapes, plates, sheets, structurals, tubing, carbon and alloy steel, tool steel, Allegheny Stainless and many others.

JOSEPH T. RYERSON & SON, INC., STEEL-SERVICE  
PLANTS AT: CHICAGO, MILWAUKEE, ST. LOUIS,  
CINCINNATI, DETROIT, CLEVELAND, PITTSBURGH,  
PHILADELPHIA, BUFFALO, BOSTON, JERSEY CITY.

# RYERSON



# Washington NEWS

## C.M.P. Amendment

W.P.B.: CMP Reg. 1, Interpretation 8 as amended February 2, is as follows:

(a) An allotment of controlled materials under the Controlled Materials Plan is only valid for the quarter (or other specifically designated period) for which it is made as indicated in the allotment certificate. An allotment which is valid for one quarter cannot be used for placing authorized controlled material orders calling for delivery in any other quarter.

(b) A consumer in placing an order for a controlled material must specify the month in which delivery is requested and the requested delivery month must be within the quarter for which the allotment is valid. Controlled materials producers are required to make delivery as close to the requested delivery date as is practicable and are prohibited from accepting authorized controlled material orders in excess of a specified percentage of their production directive or expected production as provided in paragraph (t) (2) (iii) of CMP Regulation No. 1.

(c) If a controlled materials producer is unable to accept an authorized controlled material order for delivery during the delivery month specified, and delivery is required in that month, the consumer may appeal, either directly or through his Claimant Agency or Industry Division, to the appropriate Controlled Materials Division for relief.

## Asbestos-Cement Building Materials

O.P.A. AMENDMENT TO MPR 466: Several changes in the regulation establishing maximum prices for asbestos-cement building materials to recognize prevailing industry practices were announced recently by O.P.A. Retail prices for the products are not affected.

It has been customary in the industry for producers of related products to purchase from actual manufacturers particular items to be sold under the buyer's own brand name without further processing. This is a trade practice that avoids the manufacture by each building material producer of all products in the same general line and enables him, through agreement with actual producers, to sell a more complete line of material. Recent O.P.A. action permits produc-

ing manufacturers to sell to non-producing manufacturers at higher than ceiling prices, providing the latter agree to absorb the increase. In such cases, the buyer must submit a written statement to O.P.A. that the increase will not be reflected in the selling price of his product, nor will such an increase be the basis for an application for price adjustment or petition for amendment. The price, for this type of sale, must be mutually agreed upon by the producer and the buyer.

In accordance with industry practice, manufacturers are now permitted to charge net list prices on any less-than-truckload shipments delivered in their own or hired trucks.

## Masonry Saws

O.P.A. Amendment No. 107 to MPR No. 136: Scaffolds and masonry saws have been added to the list of articles covered by the regulation establishing maximum prices of machines, parts and machinery services. The items were removed from coverage of the GMPR to place them under the industrial machinery regulation which is more closely allied to the nature of the work in which scaffolds and masonry saws are used. The change will not increase prices.

## Requisitioning Used Machinery

W.P.B. REGULATION: The following statement has been prepared by the Construction Machinery Division and has been approved by the Bureau of Internal Revenue:

"If you own construction machinery; if a government agency, having power to requisition, threatens to requisition that machinery; and if you thereafter sell the machinery to the government agency under the threat or imminence of requisition—then you will be eligible to put the proceeds of the sale in a replacement fund and avoid any Federal income taxes on the gain realized from the sale:

"If (1) Under conditions over which you have no control you are unable to immediately replace the converted property with similar property and you forthwith apply to the Commissioner of Internal Revenue, Washington, D. C., on Form 1114, for permission to establish a replacement fund in your accounts; (2) Can furnish evidence to prove that the sale was involuntary or compulsory; (3) If you furnish an income tax bond, in an amount determined by

the Commissioner, not in excess of double the amount of the tax that would be due and payable if the replacement fund were not established, guaranteeing payment of any taxes due in the event a part or all of the fund is not expended in replacing the converted property.

"If you later use the entire fund to acquire machinery similar or related in service or use to the converted machinery, or pay the tax due, subject to the limitations provided under section 112 (f) of the Internal Revenue Code, as amended, in the event a part or all of the proceeds are not so used, you will be released from liability under the bond.

"The above may be considered a general statement with respect to the relief provision of section 112 (f) of the Internal Revenue Code, as amended, and section 29.112 (f)-1 and -2 of Regulations 111, the administration of which is under the jurisdiction of the Bureau of Internal Revenue."

For owners making either voluntary or involuntary sales: "If you own and use construction machinery in your trade or business; if this machinery is subject to the allowance for depreciation; if you have held this machinery for more than six months; if the machinery is not of a kind of which you would include in your inventory on hand at the close of the taxable year; if this machinery is not held by you primarily for sale to customers in the ordinary course of business; if you sell this machinery and realize a gain subject to Federal income tax:

"Then, instead of paying your normal and surtax rate on any part of this gain, you can treat it as a capital gain and pay an alternative tax on the excess of all such gains over capital losses if it is to your advantage to do so. The alternative tax rate is 25 percent for corporations. It is 50 percent for individuals but only 50 percent of the actual gain is taken into account in the case of individuals.

"In other words, the most you can be required to pay in any event in Federal income taxes on the total gain from the sale of your machinery is 25 percent of the gain.

## Renegotiation Refunds

JOINT PRICE ADJUSTMENT BOARD: Reserves for renegotiation refunds which war contractors may set up

(Continued on page 42)



*Low  
Cost  
Fertilizer*



**RAYMOND  
LOW SIDE  
ROLLER MILL**

... has been the standby of the mineral fertilizer industry for half a century.

It is well designed for the job of producing agricultural limestone and phosphate rock, pebble or concentrates, to finenesses up to 95% passing 100-mesh.

Now that maximum farm acreage will demand huge supplies of fertilizer, the Raymond Low Side Roller Mill offers important advantages to producers . . . extra high capacity per horse-power, uniformly fine material, economy in operation and maintenance.

This mill may be equipped for drying and grinding, and used on a variety of non-metallic minerals, including gypsum, clays, dolomite, bauxite, etc.

*Ask for Catalog No. 44*

**RAYMOND  
PULVERIZER DIVISION**

COMBUSTION ENGINEERING COMPANY, INC.

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## Elected Vice-Presidents

WALLACE E. WING, M. R. Mathews and R. A. Temple, have been elected vice-presidents of the Marblehead Lime Co., Chicago, Ill. E. C. Heubner has been named treasurer, and Edna N. Harpham, assistant secretary. Mr. Wing was formerly assistant vice-president.

## Philadelphia Manager

W. C. BOWMAN, vice-president and sales manager of Philip Carey Co., Lockland, Cincinnati, Ohio, has been appointed manager of the Philadelphia district, succeeding W. L. Cremers, who died recently. Mr. Bowman became associated with the Carey organization 27 years ago.

## In the Navy

DONALD D. KENNEDY, Jr., head of the Kennedy-Cochran Co., advertising representative of rock products manufacturers, Chicago, Ill., recently left for Wellesley, Mass., where he will be inducted as a Lieutenant (j.g.) of the Corps of Supply, U. S. Navy.

## Credit Assn. Vice-President

E. W. STRANGE, assistant treasurer, Lone Star Cement Corp., Birmingham, Ala., has been elected vice-president of the Alabama Association of Wholesale Credit Men.

## Petoskey Elections

JOHN L. A. GALSTER has been re-elected president and treasurer of the Petoskey Portland Cement Co. and the Petoskey Transportation Co., Petoskey, Mich. George W. John was again named as vice-president and general manager; Homer Sly, vice-president; H. H. Lucas, vice-president and traffic manager of the cement company and a vice-president of the transportation company; Henry Galster, vice-president and assistant treasurer; and E. O. Nyman, secretary. George W. John and Louis Seelbach were re-elected as directors of the transportation company.

## Highway Research Chairman

STANTON WALKER, director of engineering of the National Sand and Gravel Association, Washington, D. C., has been elected chairman of the Highway Research Board, to succeed F. C. Lang, engineer of materials and research, Minnesota Department of Highways, and professor of highway engineering at the University of Minnesota. Mr. Walker is a graduate of

the University of Illinois and served with the Portland Cement Association as a research engineer from graduation in 1917 to 1926. Since 1926 he has been with the National Sand and Gravel Association. He also is director of engineering for the National Ready Mixed Concrete Association and consulting engineer to the National Industrial Sand Association.

## New Associate Editor for Rock Products

JAMES A. TWYMAN has joined the editorial staff of ROCK PRODUCTS as associate editor. Mr. Twyman has a background of many years of experi-



James A. Twyman

ence in the technical publication field, which will be of much value in the augmented service that will be available to the readers of Rock Products.

Mr. Twyman was formerly with International Trade Press, publishers of Cement Mill & Quarry and Concrete Products. In this work he became well acquainted with the problems of the industry. Concrete Products is now an important section within Rock Products. Later Mr. Twyman became identified with the McGraw-Hill organization, on Coal Age and Chemical and Metallurgical Engineering.

For several years Mr. Twyman was with the United States Department of Agriculture in Washington, D. C., and took an active part in several

marketing studies made by Consumers' Counsel Section. This interest led to sales development work, and several products and services have found new markets through his efforts. Mr. Twyman attended Northwestern University.

Mr. Twyman will take over some of the field work heretofore done by Mr. Lenhart who is now engaged in mining tungsten in California. However, Mr. Lenhart will continue to serve as a writer for ROCK PRODUCTS and will contribute articles from time to time on West Coast activities.

## Talc Advisory Committee

ROBERT S. PENNOCK of the W. H. Loomis Talc Corp., Gouverneur, N. Y., is a member of the talc industry Advisory Committee which is making a study of proposed price regulation covering talc, pyrophyllite and ground soapstone. Other members of the committee are Robert F. Sherwood, Caroline Pyrophyllite Co.; W. Wallace Roff, Whittaker, Clarke & Daniels, Inc.; Henry H. Hanna, Clinchfield Sand & Feldspar Corp.; J. Frazier Glenn, Georgia Talc Co. and Western Carolina Talc Co.; Grant Huntley, Alberene Stone Corp. of Virginia; J. P. Callahan, International Pulp Co.; E. J. Ellsworth, Sierra Talc Co.; and W. E. Skeoch, Southern California Minerals Co. Eugene W. Magnus, Eastern Magnesia Talc Co., is chairman of the committee.

## Bureau of Mines Engineer

LEON W. DUPUY has been appointed assistant regional engineer of the eastern region of the U. S. Bureau of Mines, including supervision of the exploratory work of the Bureau and of the experiment stations in the 21 eastern states. To secure strategic and critical materials for use in the war, the eastern regional office is operating numerous field exploratory projects from Maine to Florida.

## Enters Politics

ALEXANDER FOSTER, Jr., vice-president, Warner Company, Philadelphia, Penn., has been named to Borough Council as Councilman from the Third Ward, Philadelphia, to fill the unexpired term of the late William J. Levering.

## Made Superintendent

J. C. ANDREWS, acting superintendent of the Nebraska Cement Co., Superior, Nebr., has been promoted to superintendent of the plant.



Roger C. Gleason

### President of Wolverine

ROGER C. GLEASON has been elected president of the Wolverine Portland Cement Co., Coldwater, Mich., to succeed C. C. Jones. Mr. Gleason is a native of Ann Arbor and a graduate of the chemical engineering department of the University of Michigan with the class of 1925. He is the fourth president since the company was organized 42 years ago.

### C. of C. President

JOHN SANKEY, representative at Springfield, Ill., of the Chicago Gravel Co., Chicago, Ill., and former president of the Illinois Sand and Gravel Association, has been elected president of the board of directors of the Springfield Chamber of Commerce. Mr. Sankey was a member of the board for two years. Other officers elected are R. J. Wilcoxson, first vice-president, and L. E. Coffman, second vice-president. Henry A. Hart was re-elected as treasurer.

### Johns-Manville Promotion

J. L. WOOD, general credit manager of Johns-Manville Corp., New York, N. Y., has been appointed assistant treasurer of the corporation. Mr. Wood has spent the last two years on the administrative staff of the Johns-Manville Service Corp. at the Kansas Ordnance Plant. In his new capacity he will undertake responsibility for the settlement of problems arising from the termination of war contracts, in addition to his duties as general credit manager.

### Highway Officials President

WILLIAM J. COX, commissioner, Connecticut State Highway Department, has been elected president of the Association of Highway Officials of the North Atlantic States, succeeding Herman A. MacDonald of Massachusetts who has served as president for nearly two years. Mr.

Cox has been highway commissioner of Connecticut since 1938. Previous to that he taught at Yale University for 11 years and was also traffic engineer for the National Bureau of Casualty & Surety Underwriters. Mr. Cox is author of the "Cox Plan" described in that part of the National Crushed Stone Association report which was held over from the February issue of ROCK PRODUCTS and appears in this issue.

### Heads Certain-teed

Hector J. Dowd, executive vice-president of Certain-teed Products Corp., New York, N. Y., has been elected president of the company. The office of executive vice-president was abolished at a recent meeting of the board of directors. Mr. Dowd has been with Certain-teed since 1929, and had been executive vice-president since last April.

### Columbia Promotion

DWIGHT R. MEANS, who has been associated with the Columbia Chemical Division of the Pittsburgh Plate Glass Co., Pittsburgh, Penn., for 21 years, has been named assistant to the vice-president. Prior to his new appointment Mr. Means was technical director and had previously served as research director and assistant superintendent.

### Appointed Sales Manager

WALLACE J. HUNTER, formerly assistant sales manager of the Nebraska Cement Co., Omaha, Nebr., has been appointed sales manager. L. J. Hoenig will remain at Omaha as general manager.

### Assists Vice-President

FRED T. WIGGINS, formerly sales manager, Universal Atlas Cement Co., Birmingham, Ala., has been appointed assistant to the vice-president, general sales, New York, N. Y. Robert



E. Lee Heidenreich, Jr., consulting engineer, Raleigh, N. C., a prominent visitor to the recent New York aggregate conventions

H. Bond will assume Mr. Wiggins' duties as sales manager in Birmingham.

### In the Services

LA MAR STONE Co., Princeville, Ill., reports six of its employees in the armed services as follows: Earl D. Werner, manager, in the U. S. Army Engineers; Fred Miller, truck driver, Army Air Corps; John Noverle, truck driver, U. S. Army; James Taft, mechanic, U. S. Navy; Vergil Phillips, shovel operator, U. S. Navy; Wm. La May, tractor Diesel engineer, U. S. Navy.

### Mississippi Agstone Plant

S. C. JONES, Chickasaw County representative, and the Okolona, Miss., Chamber of Commerce are attempting to persuade the Mississippi legislature to reopen the Okolona agricultural limestone plant. Farmers are paid \$4.20 an acre for liming their land under the AAA program.



Left to right: J. Harper Fulkerson, outgoing chairman, Manufacturers' Division, N.C.S.A.; Milo A. Nice, new chairman, and Fred Braun, past chairman

## Colorado Vermiculite

VERMICULITE was first marketed in 1915 by the Denver Mining and Manufacturing Co., from a deposit about five miles from Hecla, Chaffee county, Colorado under the trade name "tung ash." There are now several operations in the Powderhorn district, Canon City, Westcliffe, and near Salida. The Alexite Engineering Co., Colorado Springs, Colo., has three claims of 360 acres under the supervision of Gene Lindberg. Alexite, as the product is called, is shipped from Iola, Colo. Black Mica Co., Minneapolis, Minn., has 22 claims totaling 3600 acres, but operations have not yet started in the new mill. Universal Zonolite Insulation Co., with holdings at Libby, Mont., is the largest producer in the world.

## Lose Wage Suit

LOUISVILLE SAND & GRAVEL CO., Louisville, Ky., won the suit brought by Sam Underwood, former night watchman, who alleged that the company owed him for \$3,483 in back wages and penalties. Federal Judge Miller dismissed the suit on grounds that Underwood's work did not come under the Fair Labor Standards Act.

A similar suit has been instituted against the Roquemore Gravel and Slag Co., Montgomery, Ala., for a total of \$8,880.16 by M. G. Coggins, plaintiff. No report has yet been received as to the outcome of this case.

## Silicones

RESEARCH chemists have worked for years on curious compounds of silicon called silicones. General Electric Company in its review of 1943 developments states that many new uses for such compounds have been found, particularly in connection with urgent war applications. From them can be made new resins which are far more heat-resistant than organic resins. Insulation is one important application. Dri-film, one result of silicone research, was developed as a new water repellant. Many materials, such as ceramics used for aircraft radio insulators, can be given an invisible film which prevents the formation upon them of a condensed film of water.

## Build Block Plant

WEST BROS. BRICK CO., Washington, D. C., has constructed a new cinder block plant which is equipped with a Besser Vibrapac machine and mixer, and low-pressure steam curing rooms.

## Permanente Sets Record

PERMANENTE CEMENT CORPORATION, San Jose, Calif., produced nearly 5,000,000 bbls. of cement during 1943, according to Henry J. Kaiser, president. What is believed to be a world

record for cement production was made in December, 1943 when 81,312 sacks of cement were produced in 24 hours.

## Mica Bonus

THE COLONIAL MICA CORPORATION, federal agency of the Metals Reserve Co., has adopted two measures to stimulate production. A bonus of \$1 a pound will be paid for mica meeting certain specifications for domestic strategic sheet mica on deliveries from February 1 through June 30. The current price of \$5 a pound for strategic mica has been extended to December 31, 1944, the \$1 bonus being offered as an incentive for early delivery and to encourage stockpiling.

## Big Quarry Shot

EYRICH QUARRIES at Guernsey, Wyo., recently shot a quarry blast involving 14,000 lb. of dynamite, bringing down 125,000 tons of rock. The charge consisted of twenty-four 6-in. holes from 60 to 80 ft. deep. The rock is being shipped to the dam at Ogallala, Nebr., for rip-rap at the rate of about 20 cars a day.

## Stone Plant Fire

OLD COLONY CRUSHED STONE CO., located in South Quincy, Mass., near Boston, was almost totally destroyed by a fire, according to a newspaper report. It is estimated that the damage will amount to \$200,000. The cause of the fire could not be determined.

## Lime Plant Fire

KEELING-EASTER LIME CO., Norfolk, Va., owned by Ballard Fish and Oyster Co., and J. H. Miles and Co., was destroyed by fire recently. The damage was estimated at about \$80,000.

## Supervisory Training for Concrete Products Men

GRAYSTONE CONCRETE PRODUCTS CO., Seattle, Wash., has had six of their supervisory employees graduate from a "job method training course" under a training-within-industry program. The men who graduated and received certificates are: Lars Anderson, H. E. Boyer, Gordon Horst, Melvin Ward, R. E. Kramer, and R. W. Condon. This is the second of a series of such courses which have been completed by this same group of men. The first course, on job instructor training, was completed some time ago. Both courses are for the training of industrial workers and are given under auspices of the War Manpower Commission.

The company is now making comprehensive studies and plans for post-war manufacturing and marketing of its products. Many new fields and applications for precast concrete products are being explored in order to extend the scope and variety of products manufactured.

## New Sand Plant

CROSSWICK SAND & GRAVEL CO., Crosswick, N. J., is building a new sand and gravel plant at Groveville, N. J. The new plant will have complete washing facilities. George J. Moser is the owner.

## County Approves Stockpiling

COMMISSIONERS of Cowlitz County, Washington have approved the establishment of gravel stockpiles in road districts Nos. 2 and 3. Each of the stockpiles will contain 7,500 cu. yd. of gravel, costing about \$1.00 per cu. yd.



Under-water screening in a phosphate washing plant



## Safety Scores in Lime Plants

THE NATIONAL LIME ASSOCIATION has announced the roster of membership in the Thousand Day Club composed of those lime plants that have completed a period of one thousand consecutive days of plant operation with no lost-time injuries.

The North American Cement Corporation, Berkeley Plant at Martinsburg, W. Va., has a record of 2748 days without a lost time accident.

Both the Springfield, Mo., and the Thornton, Ill., plants of the Marblehead Lime Company are included with 1132 days and 1516 days, respectively.

The Ash Grove Lime and Portland Cement Company plant at Galloway, Mo., has a score of 1119 days, while Warner Company's Cedar Hollow Plant, Devault, Penn., reports 1158 days.

The Haden Lime Company at Houston, Texas, is next to the top of the list with 1537 consecutive no-lost-time accident days.

All records have been verified by the U. S. Bureau of Mines.

## "E" Award to Lime Plant

THE NEW ENGLAND LIME COMPANY's magnesium plant in Connecticut has been awarded the Army-Navy "E" award. This is the first reported instance of a lime company which has received this award.

## Obtain Crusher Permit

CENTRAL PRE-MIX CO., Spokane, Wash., has obtained permission to operate a crushing plant at Yardley, Wash., from the Spokane County Planning Commission. The plot comprises 63 acres.

## Crushing Mill Fire

HEUMADER QUARRIES, near St. Joseph, Mo., lost its crushing plant in a fire, according to local reports. The plant is operated by William P. Heumader. A concrete products plant also is operated by Mr. Heumader.

## Pavement Yardage

AWARDS of concrete pavement for January, 1944, have been announced by the Portland Cement Association as follows:

	Square Yards Awarded During Jan., 1944
Roads .....	96,041
Streets and Alleys.....	241,566
Airports .....	708,105
Total .....	1,045,712

## Making Cinder Block

NATIONAL BRICK & SUPPLY CO., Terra Cotta, D. C., recently started to manufacture cinder block. Equipment includes a Besser Vibrapac machine and mixer. High and low-pressure curing facilities are available and

weigh batchers are used. A new building has been erected for concrete product manufacture.

## Asphalt Paving Conference

WHAT PROMISES to be the opening gun in a lively battle for post-war highway business was started in Springfield, Ill., the state capital, on February 23 and 24. It was the first Illinois State Asphalt Conference. Also, it was said to be the first of a series of such state conferences to be held in all of the 48 states.

The conference was under the auspices of The Asphalt Institute, New York City, the association of asphalt producers. The cost of the conference, including free luncheon, cocktail party and banquet, was provided by those interested in asphalt paving in the State of Illinois. There were aggregate producers, asphalt applicators and distributors, contractors for hot mixtures, material suppliers, emulsion manufacturers, testing laboratories, and such members of The Asphalt Institute (the petroleum producers) as sell their products in Illinois. The contributors from the aggregates industries were: Chicago Gravel Co., Columbia Quarry Co., Consumers Co., East St. Louis Stone Co., Elmhurst-Chicago Stone Co., Lehigh Stone Co., Lincoln Sand & Gravel Co., Material Service Corp., and National Stone Co.

WALTER A. ROSENFELD, director of the Illinois Department of Public Works and Buildings, made the address of welcome, which gave the conference more or less an official recognition, in a state which hitherto has been considered the leading exponent of cement concrete highways.

HERBERT SPENCER, president, The Asphalt Institute, outlined the purposes of the conference, which, naturally, was to promote a greater use of asphalt paving in Illinois.

The rest of the program had to do with details of construction methods by BERNARD E. GRAY, chief engineer of The Asphalt Institute; W. W. POLK, chief highway engineer, Illinois Division of Highways; PREVOST HUBBARD, chief chemist, The Asphalt Institute; several county superintendents of highways and commissioners of public works, from throughout the state.

Others on the program were H. E. HORNER, Civil Aeronautics Administration, and E. F. KELLEY, U. S. Public Roads Administration.

The conference was made up mostly of state, county and local highway officials, contractors and material men. As a rough estimate probably about 350 attended. It was intended as a school to bring all interested up-to-date on asphalt paving practice.

Mr. Gray paid high tribute to the engineering and laboratory depart-

ments of the three national aggregate associations for their contributions toward the betterment of asphalt highway construction. EDWARD W. BAUMAN, of the National Crushed Stone Association's engineering department was among those present who took part in the "round-table" discussions.

## Renegotiation Refunds

(Continued from page 37)

and show in their statements and annual reports are not to be regarded by Government renegotiation officials as binding on contractors, according to a ruling by the Joint Price Adjustment Board, representing the six Federal renegotiation agencies, it was announced recently.

"The increasing practice of providing such a reserve is to be encouraged as a matter of sound accounting," Joseph M. Dodge, chairman of the Joint Price Adjustment Board, stated.

"The amount established in individual cases will vary widely, depending upon the policy of the particular contractor. It may be more or less than is actually needed when the renegotiation of the fiscal year for which the reserve has been set up is concluded. It would be manifestly unjust for the contractor to be bound by the amount of any reserve he may have created or for the existence of the reserve or the amount of it to affect the renegotiation proceedings. The renegotiation officials are instructed that such reserves are not to be considered directly or indirectly in connection with the determination of any price adjustment to be refunded to the Government under the terms of the renegotiation statute."

The six Federal renegotiation agencies are: War, Navy and Treasury Departments of the U. S. Maritime Commission, the War Shipping Administration, and the Reconstruction Finance Corporation.

## Using War Prisoner Labor

GLENCOE LIME & CEMENT CO., Pevely, Jefferson County, Mo., is reported to be using war prisoner labor. This step has been taken as it has been impossible to obtain sufficient local labor to maintain operations.

## Install Quarry Power Plant

WILLAPA HARBOR QUARRIES south of South Bend, Wash., is installing a power plant of 150 hp. motor capacity. All operations of the quarries are being shifted from Diesel to electric power.

## Buy Gravel Plants

THE LIST AND CLARK CONSTRUCTION CO., Kansas City, Mo., has purchased the property of the Welch-Sandler Sand Co., at Frisbie Station, Kans., and the Holliday Gravel Co.



# Twenty-Six Years Ago

By NATHAN C. ROCKWOOD

IT HAS been suggested we do a little reminiscing. So, instead of "25 years ago" which is the common space of time to start, we are going back 26 years ago. There are several reasons for this selection: (1) The year 1918 was the first full calendar year I served as editor of Rock Products; (2) the year 1918 was the last year of the previous World War; (3) it will prove interesting and possibly helpful to draw parallels or contrasts, with this year, 1944, which we all hope will be the last year of our second and greater World War.

February and March were important months in these industries in 1918. The National Sand and Gravel Association had just held its second annual convention and the National Crushed Stone Association its first. The National Lime Manufacturers' Association was in the throes of reorganization. Part of the promotional activities of the lime industry was being performed by the Hydrated Lime Bureau, a separate and distinct organization of producers. The Portland Cement Association was active chiefly in promoting the use of concrete for hulls of sea-going ships.

Numerous state associations of sand and gravel and crushed stone producers were organizing. Few of these early regional and state associations survived, but they were important and useful factors in organizing the national associations. The most active of these local associations was probably the Ohio Macadam Association, which for several years had been promoting macadam type highways under "Put" Sandles, as secretary, and undoubtedly it had much influence in determining the Ohio highway policies for several years.

That winter of 1918 was as severe in the Middle West as the present one is mild. Also it was the winter of the great flu epidemic. There was no pleasure or comfort in traveling. The Federal Government was operating the railways; in that respect we are much better off today. Berth space was often sold two or more times. Sleeping cars were sometimes sent out without porters, and more than once passengers made up their beds as best they could.

One night in Berth 2, I was nearly suffocated by something like hydrocyanic acid gas, coming from the smoking and toilet compartment. The next morning when everyone was crowded in there trying to wash and shave, a fellow traveler said to the porter: "Say, 'George,' what in h—ll were you using in here last night?"

"Oh," said "George," "dat was deodorizer." Evidently he had been instructed to kill flu germs, for there were plenty of them to be picked up there.

The National Slag Association was organized that winter. Harry J. Love was its first secretary and he still is. Harry has made this his only love all these years. He's a bachelor and says he intends to endow the Association with his life's savings. Certainly, in this sometimes sordid world, there are few better examples of faithfulness. His association has never made much noise, but he has accumulated and has on tap more information about all the various uses of slag than probably exists anywhere else in the world.

Two major national problems brought out the producers to local and national association meetings in record numbers. These problems were car shortage and general fumbling with the transportation system, and coal shortage. The two were interrelated because both car and coal shortages were caused by tying up thousands of loaded coal cars at the Eastern seaboard for months on end. We were then trying to fuel all the ships afloat with coal, as we are now trying to do it with oil.

The coal shortage affected all industries because it cut down power generation. Industries were classified as essential or non-essential not because of man-power shortage or inability to obtain machinery and supplies, but because they used coal and power needed for war industries. The concern of the aggregate industries and the portland cement industry was the cutting out of all highway construction. Motor trucks were not then much of a factor in the transportation industry and the Director General of Railways had absolute say as to who got cars, if any should become available. From subsequent developments as shall be told in later issues, it now looks as if the railway managements were none too anxious to speed the development of highways, although probably none foresaw what paved highways were going to do to the freight and passenger business of the railways.

The railway managements were anxious to get their tracks ballasted, and favored ones did get millions for track improvements at the public expense. Ballast business was good, but production of ballast without a market for commercial aggregate was not highly profitable. I heard some hot arguments in those days about a fair price for ballast. An old experienced

crushed stone producer used to argue that it was profitable (in ordinary times) to sell ballast at actual cost of production because commercial stone was the profitable by-product. The same argument has since been used for many years to justify the extremely low prices for agricultural limestone in the Midwest, where producers are now being faced with the accumulated effects of this practice in trying to get a real cost price.

## Annual Summary of Cement Production

BUREAU OF MINES reports that during 1943 the total production of 133,483,000 bbl. of finished portland cement was off 27 percent and shipments of 127,567,000 bbl. were 31 percent below the 1942 volumes. The rates of decline were more severe towards the end of 1943 than in the earlier months and in December the output of 8,318,000 bbl. was 41 percent and shipments of 5,603,000 bbl. were 37 percent below corresponding data of the same month in 1942.

Production and shipments of finished portland cement during the last three months of 1943 were approximately in the same volumes as average output and shipments during these months in the 1935-39 period. Stocks of finished cement were unusually low at the beginning of 1943 but were replenished to the customary level by March 31 and after that followed the usual seasonal pattern to a year-end quantity of 23,134,000 bbl.

Clinker stocks which also were low at the start of 1943, were rebuilt rather slowly to August 31 and after a short-lived decline through September and October were replenished approximately to the customary operating level on December 31. Mill values of bulk cement remained at \$1.56 per bbl. during the first half of 1943 and advanced slightly to \$1.57 in the third quarter and \$1.58 in the fourth quarter.

The following statement gives the relation of production to capacity, and is compared with the estimated capacity at the close of December, 1943, and of December, 1942:

RATIO (PERCENT) OF PRODUCTION TO CAPACITY					
	Dec., 1942	Dec., 1943	Nov., 1943	Oct., 1943	Sept., 1943
The Month	67.0	40.0	46.0	53.0	56.0
12 Months	74.0	54.0	56.0	59.0	62.0

## Fire on Dredge Boat

ARKANSAS CITY SAND AND GRAVEL Co., Arkansas City, Kans., reported a fire damaged a sand boat when it became ignited from a gas tank attached to a motor used to pump sand from the river. The gas tank was ruptured by a pulley wheel which flew to pieces. About 15 gal. of gasoline were spilled in the boat which became ignited.

# HINTS *and* HELPS

Practical Ideas Developed by Operating Men

## Governor for Truck Motor Used for Stationary Plant

By ROSS WHEELTON

TO PROVIDE POWER at a quarry, an old truck motor was converted to stationary work. The problem of gov-



Steam engine governor controls throttle on gasoline engine

erning the motor came up and was solved by the use of a fly-ball governor from an old steam engine.

A set of automobile distributor drive gears was procured, one of which was placed on the generator shaft and the other on the governor shaft. The governor was bolted to the generator frame in such a position that the gears would mesh properly.

To facilitate this, the field coils were removed from the generator frame and the armature winding and commutator removed from the shaft. The motor had been fitted with a magneto so this dismantling of the generator did not interfere in any way with the ignition system.

A coil spring was connected between the top of the governor and one of the radiator stays directly overhead. The carburetor control rod was so connected at the top of the governor that the balls would draw it down as the motor came up to speed, thereby closing the throttle slightly.

The coil spring tension can be increased or decreased as needed to make the motor run at the proper speed, and if the motor should be released from load suddenly the governor would immediately close the throttle sufficiently to prevent the motor from racing too hard.

If a similar governor could not be procured, it would be an easy matter to make one up using three solid rubber balls mounted on strips of flexible spring steel. The weight of these balls or the tension of the strips would not affect the performance much, as the heavier the balls the more tension could be put on the coil spring to prevent their closing the throttle too much.

## Recovery of Damaged Rails

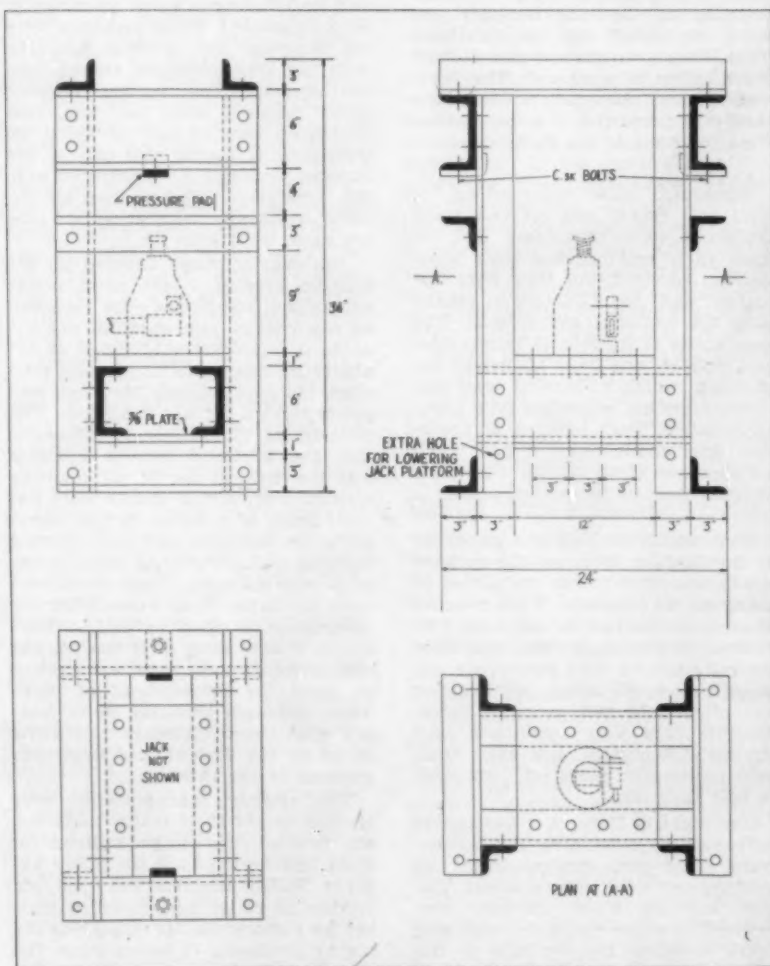
By A. B. EDSON

Callow Rock Lime Co.  
Somerset, England

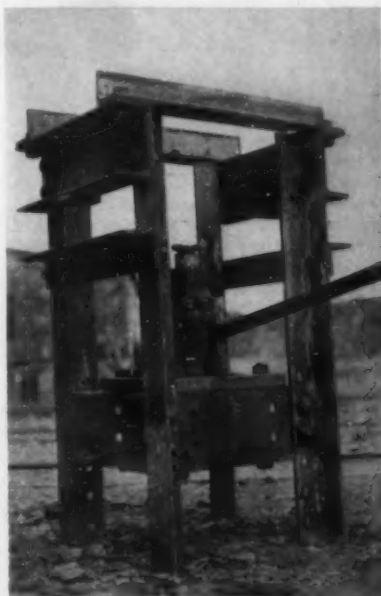
IN QUARRYING AND MINING OPERATIONS considerable numbers of light rails are bent by falls of rock, particularly during blasting operations, and although a few of those damaged can be trued by means of a jim crow

it is not easy to straighten the majority as they need correction in a vertical plane. The usual method appears to be by smithing, but this is undoubtedly slow and costly, and for this reason many rails, otherwise in good condition, are discarded.

An obvious solution to the problem of recovering such rails cheaply lies in the use of a cold press, and the device here described and illustrated represents a successful attempt to design an inexpensive semi-portable press, having as its primary purpose this particular work. Such a press has proved to be well capable of cold-straightening rails up to at least 20 lb. per yd. in either a vertical or horizontal plane when removed from ties, and to be able to salvage, quickly and cheaply, nearly 95 percent of bent rails—indeed all where the damage is not a sharp kink or within 9



Construction details of rail straightener, using an hydraulic jack



Left to right: Rail straightening press with jack in position; straightening rail vertically; straightening a rail horizontally

in. of the ends. It has well proved its efficiency as a money saver, not only on account of the value of the salvaged rails, but also because of the reduced cost of handling material over track kept in good repair.

The press frame requires no castings or machined parts and it can be made almost entirely of stock M. S. sections. Pressing power is provided by a suitable hydraulic vehicle jack which can be removed quickly for use in its normal capacity. This is a most useful feature of the device, as such a jack may be already available, or, if purchased, becomes available for general use as well as for pressing.

The press frame is constructed of angle iron uprights and top ties, with two pairs of cross channels, the whole being assembled by bolting, riveting or welding, or by a combination of these methods. The hydraulic jack is mounted on a substantial sole plate attached to the top of the lower channels, and the whole base is given a box-section construction by the use of a second plate on the underside of the same channels. Two pieces of angle iron are fitted across the frame at a suitable height to act as rests or skids for rails under treatment, and two further angles can be secured to the base of the uprights to take foundation bolts if required. An important feature is the provision of two pressure pads of 2- x 5/8-in. or other suitable bar on the underside of the upper channels. For bending in a vertical plane a rail is adjusted so that it is pressed against the pads, thus ensuring that strain is exerted approximately in the center of the press, while when bending a rail sideways the bulk of the rail is

bedded on the pads to allow the flange to be clear of the channels.

A suitable type of hydraulic jack is one of 8-ton capacity, having a threaded extension to the ram, for the rapid adjustment of height and a quick-release worked by a movement of the operating handle. The method of securing it to its platform will depend on its shape, but only the simplest form of location is necessary, and the jack should not be altered in any way which would detract from its usefulness for other work.

The weight of the press shown on the drawing is a little over 300 lb. without the jack. The dimensions given are suitable for a jack of a closed height of 11 in. The distance between jack platform and pressure pads should be altered if necessary

to suit the jack in use.

The usefulness of the press is not confined to rail straightening, however, as it can be employed equally well for bending rails to a required shape, as for instance, for horizontal curves, or vertically for junctions between horizontal and inclined planes.

### Fence for Conveyor

A PERMANENTLY INSTALLED field conveyor system, to operate at a low cost for a long period of years has to consider possible losses due to stray cattle, horses and trespassing in the vicinity of the belt. A southern cement plant uses such a system and has flanked its conveyors with a neat, substantial and well built fence using concrete posts of their own manufacture. Brush fires cannot do much damage to such a fence.



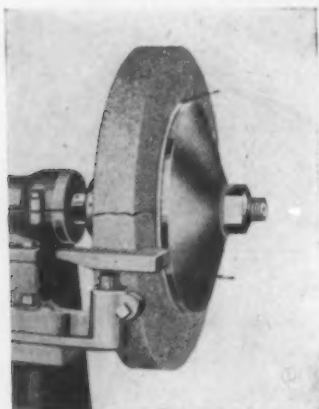
Barbed wire fence strung on concrete posts protects conveyor belt system right-of-way against trespassing



# NEW Machinery

## Grinding Wheel Safety

INDUSTRIAL PRODUCTS CO., Philadelphia, Penn., has developed a method of making grinding wheel operation more safe. Frequently accidents occur



Showing a 14-in. diameter wheel equipped with safety washers, which after being broken had a continuous run for five hours

when broken segments of a grinding wheel leave the shaft. This type of accident has been largely overcome by the use of 20-gage steel discs to which have been vulcanized a surface of specially compounded rubber, one washer being applied to each side of the grinding wheel with the rubber adjacent thereto. When pressure of the outside steel flanges is applied, the rubber is forced into the porous surface of the wheel holding it firmly in place. The stress in the wheel, due to centrifugal force, is transferred to the safety washer, which in conjunction with the shaft carries the load. These washers are available for wheels having flanges up to 30-in. diameter.

## Gas Analyzer

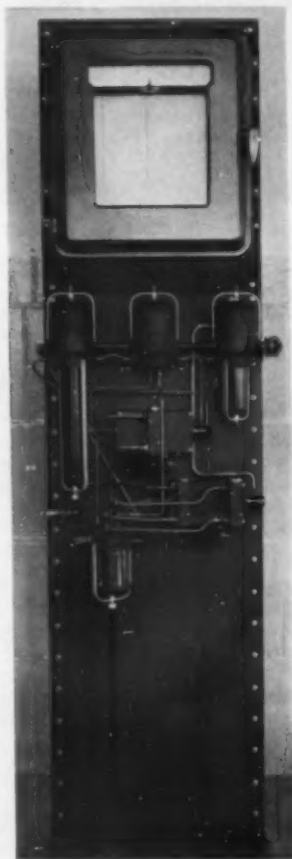
CAMBRIDGE INSTRUMENT CO., INC., New York, N. Y., has developed a gas analyzer which continuously records the  $O_2$ ,  $CO_2$ , CO, and  $H_2$  in combustion processes.

The complete analyzer operates directly from the alternating current supply line. The recorder may be located at any required distance from the sampling point and the instrument can be furnished with contacts for operating warning signals or to actuate various control circuits.

In theory the instrument accomplishes analysis by direct comparison of thermal-conductivity of the sample

with that of a reference gas or by comparison of thermal-conductivity of the sample before and after chemical absorption or combustion.

This principle of operation permits units to be assembled to meet many special problems. In the operation of a typical unit a continuous sample of the gas is drawn into the analyzer by means of a water bubbler-aspirator. The exact detail of the analysis procedure varies with the constitu-



Gas analyser which records continuously  $O_2$ ,  $CO_2$ , CO, and  $H_2$

ents of the sample but may involve a chemical absorption and/or combustion. The aspirator mentioned above not only draws in the sample gas but meters it, as well as the air which may be required for combustion in the analysis procedure.

In all applications the results are recorded directly without any corrections or interpolation of any kind. The recorder is automatically connected to the circuit of each analysis cell in succession, the duration of each connection being one minute.

There is no additional time lag between points because the gas sample flows continuously through all cells.

A continuous record of the analysis is provided on a 10-in. strip chart, and the four different registrations (one for each gas) are shown by different colors and numbers on chart.

## Repairing Old Belting

So-Lo Works, Loveland, Ohio, has announced that Industrial So-Lo, a product for repairing breaks, filling holes and for resurfacing industrial belts of all types, is now being made with synthetic rubber. The manufacturer claims it will greatly lengthen the life of belts and permit continued use of some conveyor belts that might otherwise be discarded. One quart covers approximately 14 sq. ft. It is said to have great resistance to oil and grease, spreads easily and dries smoothly. The product consists of a cement primer and a mastic. The belt surface is roughened and the primer applied; the mastic is then spread on. This product also is used for resurfacing metal, wood, and composition pulleys.

## Fire Extinguisher

AMERICAN-LA FRANCE-FOAMITE CORPORATION, Elmira, N. Y., is marketing what is known as the Alfite carbon dioxide engine of 100-lb. capacity which is approved by the Underwriters' laboratories for use on both electrical and oil fires. It is also equipped with an anti-static horn to protect the operator from a static charge.

The fire extinguisher is recommended for fires in flammable liquids, alcohol storage, electrical machinery, and for other class "B" and "C" fires. It smothers fire instantly with carbon dioxide gas which expands upon discharge to 450 times its stored volume.



Carbon dioxide type fire extinguisher for both oil and electrical fires



## Air-borne Scraper

LA PLANT-CHOATE MANUFACTURING Co., Cedar Rapids, Iowa, has developed a smaller model of its 1 3/4-cu. yd. struck capacity scraper for the U. S. Airborne Aviation Engineers which it is believed will be adaptable to many peace time applications. Designed for loading into the door of a transport plane or glider, the new unit is known as the Airborne Scraper. The scraper can make a full 90 deg. turn or less within a circle diameter of 20 ft. without overturning. The present scraper is designed to be pulled by tractors employed by the airborne engineers. After the war, however, it will be suited for use with the small Caterpillar D-2 tractor although its size will be increased proportional to the tractor.

Both the bowl and apron of this model are hydraulically operated by a recently designed hydraulic system. The hydraulic pump is located on and driven by the tractor, while two double acting jacks control move-



Small, easily maneuverable scraper for excavation and material handling

ment of the scraper bowl and apron. A three-position valve raises, lowers, and holds the cutting edge in position, and exerts the down pressure. This force regulates the cut from 0 to 6 1/2 in. The scraper is the front-dump type; as the bowl tilts forward the apron automatically opens.

## Full-Floating Screen

THE IOWA MANUFACTURING CO., Cedar Rapids, Iowa, has brought out a horizontal vibrating screen for stationary and portable gravel plants under its trade-mark, Cedarapids. It is a horizontal vibrating screen of the full-floating type with no transmission of vibrations to the subframe and with directional vibration forces that cannot become unbalanced, states the manufacturer. The motor, driven by a V-belt drive and replaceable by a countershaft, is mounted to one side of the frame on a detachable platform.

Several advantages are claimed for this screen. When installed on a portable plant, it gives complete access to either roll or jaw crusher by simply removing crusher hopper. It operates flat, moving the material by the action of the screen rather than by gravity, and thus affording more accurate control over the screening. Its construction allows the piling on of material without injury to the screen cloth, which means faster



Horizontal vibrating screen of the full-floating type

yield per hour, or in other words, more capacity. Furthermore, several elements of convenience, such as the ease and simplicity of installing a new section of screen cloth or rearranging the combination of sizes, and the fact that this type of screen saves headroom, are obvious advantages both in working and in transporting.

These horizontal vibrating screens are available in a variety of sizes, single, double, or triple deck, ranging from 2- x 4-ft. to 4- x 14-ft.

## Plasticized-Cotton Fabric

SOUTHERN FRICTION MATERIALS CO., Charlotte, N. C., is making a new cotton fabric which may have a number of applications in the rock products industry. At present a large volume of this material is being used for shoe bottoms as a replacement for leather. It is said to outwear leather, and should be suitable for chute linings, stair treads, mountings for motors, and other similar uses. The new material is a resin-treated cotton fabric, capable of withstanding sustained temperatures of 250 deg. F., and 350 deg. F. momentarily. A standard size sheet of the material is now 18- x 72-in., but it could be supplied in 36-in. widths, if necessary. The maximum thickness at the present time is approximately 5/32 in., but it could be manufactured in heavier thicknesses.

## Dragline Chain Repairs

AMERICAN MANGANESE STEEL DIVISION, American Brake Shoe Co., Chicago Heights, Ill., has recently patented through John O'Fallon Clark a dragline chain repair link which enables quick repairs on the job. For larger chain, with from 1 1/4-in. to 2 1/2-in. section, having the longer pitch lengths, the M-91 is recommended. The halves, with interlocking lugs, are secured by four rivets to produce a tight joint. For smaller chain from 3/8-in. to 1 1/8-in., the

R-890 is more adaptable. In it, tapered ends fit closely into grooves in the opposing half link, and the two halves are joined together by a single



Two types of dragline chain repair links; (R-890) for smaller chain, and (M-91) for larger chain

rivet through the joined center lugs. The center bar or stud prevents the kinking that might lead to destructive jerks in operating.

## Circuit-Breaker Slide Rule

ALLIS - CHALMERS MANUFACTURING Co., Milwaukee, Wis., is offering in slide rule form a simplified means for determining the correct size air circuit breakers for all industrial substation applications. With the slide rule it is comparatively easy, for example, to calculate the interrupting capacity of the 600-volt class air circuit breakers needed for control of power. The Unit-Sub rule, as it is called, has been constructed from standard A.I.E.E. formulas for determining short circuit currents, and takes into consideration all necessary factors, such as motor load and d-c. component.

# QUARRYING

## Ballast for Burlington

The E. C. Schroeder Co., Inc., is producing large tonnage of crushed stone ballast for the Chicago, Burlington & Quincy Railroad

By RALPH S. TORGERSON

**A**T WYALUSING, WIS., near Prairie du Chien, the E. C. Schroeder Co., Inc., has opened up a quarry and set up a screening and crushing plant which is designed to produce about 100,000 tons of ballast annually for the Chicago, Burlington & Quincy Railroad on whose property the quarry is located. In addition, about 50,000 tons of rip-rap have been produced during 1943 to protect the embankment of the right-of-way at various points along the line between Savanna, Ill., and St. Paul, Minn., where it parallels the Mississippi river.

The quarry is located very close to the screening and crushing plant which parallels a siding off the main line of the railway. As now operated, the quarry presents a face 80 ft. high with a relatively shallow overburden. Drilling is done with a Bucyrus-Armstrong blast hole drill driven by a Lerol gasoline engine. Holes are driven at points 12 ft. apart and 12 ft. back of the face to the full depth of 80 ft. A 60 percent Trojan powder is used, each shot bringing down about 2½ tons of rock to a pound of powder.

A 1¼-cu. yd. Marion shovel is employed to load trucks hauling rock to the primary crusher of the plant. A ¾-cu. yd. Link-Belt Speeder type shovel also is available for this pur-

pose and for removing overburden. Nine International Harvester trucks and two Koehring Dumptr haulage units are used to transport rock to the plant.

Secondary drilling and blockholing of rock too large to handle with the shovel is done with pneumatic jackhammers. One Ingersoll-Rand and two Gardner-Denver compressors are available to supply air for this purpose.

An ingenious arrangement has been made to reduce the length of the belt conveyor inclining up to the plant screen structure. As may be noted in the illustrations, a ramp has been built up to the hopper feeding the 20- x 36-in. Universal primary jaw crusher, using quarry waste rock for fill. Trucks dump into the hopper at about 15 ft. above track level, permitting the installation of the crusher on a concrete foundation approximately 6 ft. above the ground and also providing ample room to drive it by belt from an 8800 Caterpillar Diesel engine. This cuts down the required length of the main conveyor belt, reduces the angle of elevation, and makes the crusher accessible for workmen making repairs or cleaning out.

Primary crusher throughs are fed to the 24-in. conveyor belt, 104-ft. centers, which carries the material to a 4- x 8-ft. Simplicity triple-deck vi-



David Vickery, superintendent of the ballast plant

brating screen which is driven by a 20-hp. Allis-Chalmers Diesel engine. The three screen decks have the following screen openings, respectively: 1¼-in., ¾-in., and ½-in. Rejects from the top deck are chuted to a 20- x 40-in. Universal roll crusher, the crushing rolls being set to produce minus 1¼-in. stone. The throughs are returned to the main screening plant conveyor by a paralleling belt conveyor, about 75-ft. centers, and transferred by chute to the screening plant belt conveyor, completing the circuit. The roll crusher also is driven by a 8800 Caterpillar Diesel engine.

The plant produces material to A.R.E.A. specifications which are as follows:

BALLAST GRADATION	
Screen mesh square openings	Percentage passing
1½-in. ....	100
1-in. ....	90 to 100
¾-in. ....	25 to 60
No. 4. ....	0 to 10
No. 8. ....	0 to 5
200-mesh. ....	0 to 1

No provisions have been made for mechanical stockpiling at the plant. Practically all ballast stone is chuted through a surge bin directly into gon-

(Continued on page 52)



Left: Dumping into 20- x 36-in. primary jaw crusher. Right: Long conveyor inclining up to screen and surge storage bin; also shorter return conveyor from secondary jaw crusher with chute to long conveyor

## QUARRYING



Loading stone into truck for delivery to the primary crusher at the plant. Secondary drilling to the right



Limestone quarry face is about 80 ft. high. Note blast hole drill and gasoline engine, above center, and to the extreme left is the tractor used for stripping operations

MARCH, 1944



## Surge Stockpiles Reduce Delays

John D. Gregg plant in Southern California has unique system of stockpiling and reclaiming belt conveyors

By JIM MEDFORD

**S**ERVING the Los Angeles area from the main plant in the Big Tujunga Basin near the junction of the San Fernando and Tujunga Boulevards since 1932, the John D. Gregg all-electric plant is now operating under an improved, flexible and speedy pit-to-plant system worked out by John Gregg in cooperation with W. E. Saxe, field engineer of the Conveyor Co., Los Angeles.

All material is delivered in over-the-highway truck and trailer units, gasoline for the short hauls and Diesel for longer line deliveries.

Under the plan now in effect the 1½-cu. yd. Lima electric shovel, the 25-ton steel hopper and the 24- x 36-in. Traylor track-mounted primary crusher were retained. The crusher, mounted on a specially built car, is fitted with a bar grizzly and a by-

pass for the fines to the conveyor belt without passing through the crusher. The crusher is fed from the 25-ton field hopper by a 48-in. conveyor belt, 100-ft. centers. This conveyor operates on a 180-deg. swing in front of the car so that the cut is 360 ft. wide with a 100-ft. face. Mounting of primary crusher on a wide gage rail truck is a pioneer idea of John Gregg, this being one of the two known to be so mounted in the United States. (See *Rock Products*, April, 1940, p. 29.)

But from this point, instead of the long single conveyor from primary crusher to surge hopper formerly on brow of pit, the material moves from

the primary crusher on a 36-in. Goodrich conveyor belt to the first interchanger, part of the new installation. This entirely eliminates the surge hopper.

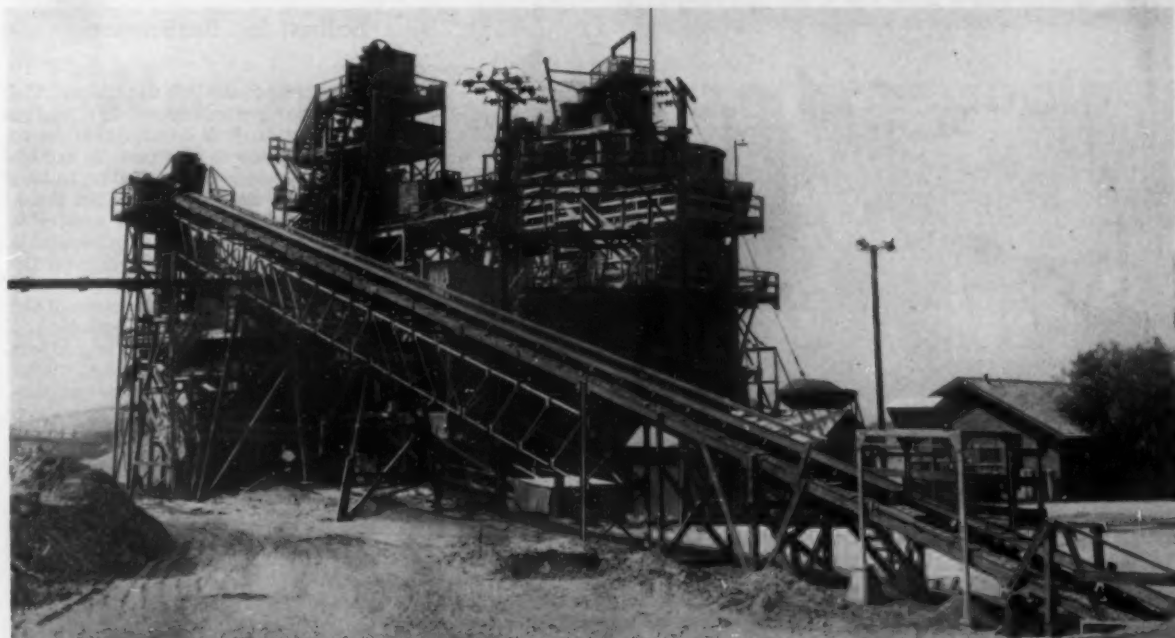
From the first interchanger, material moves at right angles onto a 36-in. boom conveyor, 650-ft. centers, with an inclination vertically of four inches to the foot and discharging at 60-ft. height. Supported by a steel cantilever frame, it discharges the raw material onto the stockpile, giving a reserve of 60,000 tons of which 20 percent is live storage.

Under the concrete base of the stockpile a Sterling-Speed-Trol, or conveyor tonnage-feeder, adjustable for plant demand, delivers material to a 36-in. conveyor belt travelling 250 ft. per second. The second interchanger receives and discharges from



View of operations in the pit, showing electric shovel, rail-mounted crusher, conveyor, and stockpile. In the foreground is the conveyor leading from stockpile to second interchanger





Final section of belt conveyor inclining up to plant. Continuous weighing mechanism is located at point where conveyor emerges from tunnel. Sand washer and classifier (not shown) to the left

the side onto a 24-in. belt conveyor travelling 500 ft. per second direct to screening and sizing plant 100 ft. above pit floor.

At the point where the conveyor leaves the tunnel to rise to the crushing and screening plant, a set of Fairbanks, Morse conveyor scales has been installed. These scales are equipped with a tonnage recording mechanism which gives accumulative tonnage on the register. In addition to this they are connected by remote control with a recording dial in the plant office which gives the following information: (1) Time of starting and stopping; (2) tons per hour; and (3) total tons for the day.

Before making this installation it was almost impossible to get the plant started within 20 or 30 minutes of the scheduled time, and there were always minor repairs that had to be made ahead of starting. We now find that these repairs can be and are made the night before. The feed on the plant is supposed to go on at 6 a.m. and it is amazing how accurately they hit this on the head. They rarely miss it by one or two minutes.

In addition to this recording instrument, the superintendent also has two Esterline recording meters, one connected to the plant and the other to the pit operation. In this way he knows at a glance just what power the plant is taking; in other words, just what load is on the mill. The chart on the pit installation is so sensitive that it shows each dipper full taken by the shovel, and therefore serves as a guide to keep the plant uniformly loaded.

#### Produce 22 Sizes

Passing through a 48-in. Allis-Chalmers scalping screen, the various sizes are picked up by motor-driven conveyors for delivery to Allis-Chalmers Newhouse gyratory crushers set for approximately a 2-in. opening. The final reduction is with two Type R322 Allis-Chalmers crushers and a set of 16- x 48-in. Allis-Chalmers rolls, where rejects from the scalper are converted into No. 4 rock. Allis-Chalmers and Conveyor Co. vibrating screens are used throughout for both crushed rock and sand, of which there are 22 sizes including plaster and asphaltic sand.

The water to the plant is furnished by a Layne-Bowler motor-driven deep-well pump with 1500 g.p.m. capacity. A special sand classifier removes the very fine sand from the waste water. This asphaltic sand is important in the production of asphaltic concrete and as an admixture for straight concrete.

Two 1250-ton steel storage tanks for concrete sand, not over  $\frac{1}{4}$  in., and for plaster sand,  $\frac{1}{8}$  in. maximum, are a feature part of the plant. A system of controlled screens, three in number, can take care of any quantity of plaster sand. Each screen



Stockpile of washed concrete sand with conveyor and loading tunnel for trucks. At left is one of the steel storage tanks



Screening plant with office to the right and sand classifier at the extreme left

has a conveyor and elevator dumping into the receiving hopper. When full, surplus overflows into a steel sand storage tank. Sand can be taken from the bottom of one tank, elevated above and across to the other tank. Surplus washed concrete sand goes to outside storage or stockpile with a truck-loading tunnel below. Truck loading tunnels are also beneath both steel storage tanks.

This plant, originally constructed to produce a total of 60 tons per hour, now has a maximum capacity of 350 tons per hour after conversion with no change in processing plant, due to the more efficient conveyor system and the modern arrangement of pit equipment for supplying raw material.

The terrain surrounding plant and to one side of the pit lends itself to an orderly system of loading facilities and segregated stockpiles and at the same time it is economical by its very simplicity. It includes conveniently placed hoppers that are charged from stockpiles by either a crawler-mounted Northwest or a Link-Belt Speeder clamshell rig mounted on pneumatic tires. These are quickly converted to dragline operation when conditions warrant.

To handle deliveries from this modern plant, a fleet of twelve Diesel trucks with Fruehauf trailers are in constant service. Painted a bright red and yellow and kept in the peak of condition by a staff of experienced maintenance mechanics, they are serviced in a new and up-to-date shop with a drive-through arrangement. One long pit can service truck and trailer without uncoupling. This is a time-saver. Also, trucks pull right through the shop without backing when service is completed. For overhaul, two long pits are joined together at one end by traverse pit with tool bench at lower level.

Radiator service is facilitated with a raised platform and tool bench located at the point where the front end of the truck is spotted. A shop-built overhead crane on a track

speeds heavy overhaul, such as engines. Parts are all salvaged, repaired and stocked for future use. Tires are recapped in shop, repairs are made as needed and tires not in service are carefully stocked for future needs. Recapping is done just before breaker strip is exposed. Two recaps are usual to a carcass. All plant and pit maintenance is handled by the mechanical staff except excessive fractures in heavy parts.

Equipment in addition to that previously mentioned includes: Mack, Diamond T and Autocar Diesel trucks, and a  $\frac{1}{2}$ -cu. yd. Northwest shovel for sand loading and a sand pile fringe.

John Gregg's "right and left bowers" are Phil Flynn, plant superintendent, and John H. Jackson, in charge of sales and transportation.

Commenting on this plant's flow sheet of operations, John D. Gregg says, "While I have been in the sand and gravel business for many years, it was hard for me to realize just what a surge pile would do for the production of the plant. I knew that there were a great many interruptions between the actual digging operation and the plant, and any interruption in either the plant or pit would shut down the whole operation. I first tried out the idea of a surge pile or bin by installing a steel bin of approximately 700 tons capacity. This was very fine but it only provided for about a two-hour leeway. My next step was the present installation which has a total storage of approximately 60,000 tons of which 20 percent is live. At one time I had a serious breakdown on my shovel and it was two weeks before parts could be obtained and repairs made. The plant ran continuously all this time. A bulldozer was used to push the material in the surge pile to the feeder as the live storage was exhausted. I am now planning on raising the head pulley over the surge pile by approximately 12 ft. which will roughly increase my raw storage about one-third."

## Ballast for Burlington

(Continued from page 48)

dola freight cars on the siding. The cars are spotted under the loading tippie by an R D 4 Caterpillar Diesel tractor which is also used in removing overburden in the quarry, to keep the quarry floor clean and for maintenance of roadways from quarry to plant by the use of a bulldozer. A driveway has been provided below the screening plant to load trucks with stone but the primary function of the plant is to make railroad ballast.

The plant is designed to produce 100 tons of ballast per hour with a total output of 1000 tons per day. It is also planned to stockpile a small amount of rip-rap stone for emergencies.

Main offices of the E. C. Schroeder Co., Inc., are at MacGregor, Iowa, but the company also has important contracts and offices in Oklahoma. E. C. Schroeder is president; Paul E. Schroeder is secretary-treasurer; and David Vickery is superintendent of the Wyalusing quarry and plant.

## Beach Sands for Silica

TREATMENT of beach sands of Del Monte, Calif., to produce a raw material suitable as a source of silica for the possible production of flint glass of good color has been accomplished in a pilot plant of the Bureau of Mines in cooperation with a glass-manufacturing company, according to announcement by Dr. R. R. Sayers, Director of the Bureau. The most objectionable impurities in these sands are the oxides of aluminum and iron.

In the pilot-plant studies, conducted with the assistance of two employees of the glass company, Del Monte sand was treated in a special test froth-flotation cell built in a Bureau of Mines laboratory. The result was a product which held the impurities within the desired limits established by specifications of glass manufacturers. The specially designed flotation cell is so simple, it is claimed, that it can be assembled mainly by a carpenter and should be of interest to persons who have found it difficult to acquire manufactured flotation cells suitable for coarse granular material.

## To Open Granite Quarry

PLANS have been completed for the construction of a granite quarry plant and bunkers just north of Pateros, Wash., on the D. F. Nickell property. It is reported a deal was consummated more than a year ago whereby operators would take over the Nickell granite property and start construction. The war slowed down the plans, but present indications are that work will be started soon.

# War and Post-War Prospects

Abstract of address by Thomas S. Holden, president F. W. Dodge Corp., before joint meeting of N.S.&G.A. and N.R.M.C.A.

**G**ENERALLY SPEAKING, the construction industry is standing by, waiting for a lifting of restrictions to give a green light for some kind of work to get started in order to begin meeting the deferred demand. The W.P.B. has given notice that there will be no early relaxation of restrictions and that the timing of such relaxation will depend principally upon the fortunes of war.

The industry accepts the fact that its activity during part or possibly all of this year will be a volume of activity somewhere between the volumes of 1934 and 1935. The Dodge contract total for the 37 eastern states last year was down 60 percent from the record year 1942; the present indication is that this year's volume will be 45 to 50 percent below that of 1943.

In the meantime, every week and every month of restricted activity brings an increase in the deferred demand for maintenance and repairs on all our existing structures, further increments of demand for new building and engineering works and further increases in idle purchasing power.

Our own estimate as to the volume of activity is that total construction volume in the first ten years after the war will average double the average annual volume of the prewar decade, which would be a 5 per cent increase over the average annual volume of the years 1920-1929, a postwar decade more prosperous than any other peacetime period in the country's history.

We think residential building should average three times its prewar annual average, non-residential building should average 70 percent greater and heavy engineering construction should average 50 percent greater. A lower percentage increase for heavy construction than for building is estimated because we expect private investment in residential and non-residential building projects to increase by much higher percentages than would either public building or public engineering projects. These advance estimates in terms of dollars are assured as representing volumes in terms of prewar costs.

Very few people think today that artificial stimulation will be required in order to get a construction revival



Thomas S. Holden, president of F. W. Dodge Corp., one of the principal speakers at the convention

started. Principal deterrents to a highly active market today, aside from the restrictions of L-41, are shortages of some highly important materials (notably lumber) and almost all types of installed building equipment, and shortages of manpower and transportation. A green light for highway construction might not cause any serious problems with respect to the fairly simple list of required materials, but would create new problems in transportation and unskilled labor supply.

## Much Deferred Maintenance

It is likely that a majority of structures in every building and engineering classification requires some measure of work to be done on it. Owners of existing properties would not wait to get the feel of postwar trends of costs and rents before deciding to spend their money, as they would be likely to do in the case of new investments, if early relaxation might be made with respect to certain types of deferred maintenance and repairs.

It is likely that restrictions will be lifted gradually and, if true, construction revival itself will be gradual.

Closely related to deferred maintenance and repairs, in character of work and in urgency of demand,

would be modernization of existing structures and conversion of war structures to peacetime standards, including the replacement of inferior substitute materials and equipment with standard materials and equipment.

In the field of private building, earliest demand is likely to be for houses, particularly those to cost, with land, over \$6,000, the class that has been demanded by war restrictions. The low-cost house demand has been largely met by the war-housing program, and indeed some centers may find themselves with surpluses after the war. Rental housing and commercial buildings may not appear in large volume in the early stage of revival but industrial buildings for non-war industries are likely to come into the picture fairly early.

Highway construction will get early consideration because its material requirements are simple and non-critical and because it has the virtue of getting under way very quickly. Furthermore, the basic principle on which federal aid is extended is firmly established. Considering this and the need for stepping up maintenance for the railroads, it would seem that producers of sand, gravel, crushed stone and ready-mixed concrete are in a somewhat favored position with regard to post-war recovery.

After World War I it took six years for deferred demands to be satisfied, of which the net recovery period was four years. As to where the money for post-war construction is coming from, everybody knows the money is here, waiting for the time when wanted peacetime goods become available. Senator O'Mahoney has reported that the country's money supply amounted to \$77,500,000,000 last August 31. Another estimate on a different basis, by the National Association of Manufacturers, is that the public buying power on December 31, 1943, was \$58,000,000,000.

A post-war economic climate favorable to investment of risk capital would naturally swell the volume of private construction and for that reason and the availability of ample buying power and ample mortgage funds, prompt me to believe that private post-war construction will



go beyond mere fulfillment of deferred demand.

The prospect of early revival of private construction, with ample financing, has about silenced the clamor for post-war federal emer-



C. W. Shirey, Waterloo, Iowa

gency works programs with subsidies for states and local governments, but it is obvious that there must be provided public and community facilities as a vitally necessary supplement to private construction.

#### Large Federal Financing Not Essential

The relation of required national income to national debt does not indicate that federal financing of local improvements on a lavish scale is warranted. However, the States are generally in good financial shape, ready and able to declare their independence of Washington. Local governments have also been saving money and reducing debt and many have developed post-war public works programs with the expectation of paying their own way. However, making local governments self-supporting and self-starting as to their improvement programs is going to become a real post-war problem. The solution rests principally in limiting federal tax collections. It should be recognized that the country's post-war tax problem involves the tax policies of States and local governments as well as the federal.

The post-war construction prospect is excellent, but realization of its potentials will depend not only upon the soundness of the country's management of the transition to a peace economy but also upon the kinds of over-all economic policies the country will adopt as long-range measures. If we are wise enough to meet the obvious and important problems that lie ahead, we should see a prolonged period of general economic expansion and large construction activity for an extended period of years.

## Plans Must Be Ready at End of War

**P**RECEDING Mr. Holden's paper on "War and Post-War Prospects for the Construction Industry," at the National Sand and Gravel Association convention, abstracted elsewhere in this issue, Major-General Philip B. Fleming, Administrator, Federal Works Agency, presented a paper emphasizing the need for having post-war construction plans ready at the war's end. General Fleming advocated a national program for planning to meet the problem of post-war employment.

The mere existence of a program for the days of transition to which all could subscribe and which would provide a guarantee of no period of stagnation, in his opinion, would do much to bolster morale at a time when men should be devoting their full energies to the war effort.

Gen. Fleming spoke at considerable length on the problems that will confront industry in converting its energies and facilities to civilian markets, and the uncertainties which confront industry in making its plans. More than 15 million people are working on war goods and there are, or will be, 11 million men in the armed forces, most of whom will have to be transferred to new jobs or be absorbed into industry.

The task of providing jobs is so great that we ought to be getting very much concerned about it, in General Fleming's opinion. He is in agreement with the emphasis being placed on the important contribution that construction activities can make in taking up some of the unemployment slack during the transition period, in all forecasts of what should be done. But, he emphasized the importance of acquiring sites, making engineering surveys, preparing working drawings, writing specifications and drawing up contract documents in advance. He mentioned the recent survey completed by the National Association of Manufacturers that a 15 billion dollar building program would develop in the first year after the war, including an estimated 6,500,000 new homes. However, he questioned how much of this construction has been planned. The reason so few actual plans have been made is because of the uncertainties of jobs, finances, etc.

On the other hand, he said that various governments are large consumers of the products of construction and have a recurring need for streets and highways, schools, hospitals, water systems and many other types of improvements involving construction. States, counties, and cities already know what their needs are going to be, they have no reason for hesitancy and there is a large

backlog of accumulated need. Yet, he said that public authorities are little further advanced in their planning than private business, with the exception of a few governments like New York City and New York State, which have made special appropriations for the purpose.

Some cities are not planning because they do not have the money; some have the money but are afraid that taxpayers would object to spending it for planning; while others prefer to reduce taxes. Many small communities need leadership to help get them started, while the vast majority are probably waiting to see what aid will be forthcoming from the federal government.

General Fleming said that the Public Roads Administration of the Federal Works Agency has an appropriation of 60 million dollars which can be used in cooperation with the States in highway planning which is to be matched on a 50-50 basis. Yet, many States have not yet applied for any part of the federal funds to which they are entitled.

In making his plea for advance planning, he said that a poor set of plans can cost as much as 50 percent of total construction cost. In concluding, he stated that a federal incentive for planning is necessary, and the best incentive is a financial one.

COL. WILLARD T. CHEVALIER, Publisher of *Business Week*, in discussing the same subject as Mr. Holden and Major-General Fleming, agreed with General Fleming as to the need for planning and public works construction, but disagreed in the method of handling.

He emphasized the need for confidence and said that the dangling of federal funds is a reason why initiative has been lacking, in referring to subsidies. All federal help of this character carries a price as far as Col. Chevalier is concerned.

The best solution in his opinion is for industry to produce more and more products in order to create more and more wealth, which was lacking following the last war. Col. Chevalier pleaded for more individualism and less collectivism and the removal of the evils that restrict business. He cited industry's past performance as a good argument for individualism.

#### Discussion

An informal panel discussion on individual planning in the sand and gravel and ready-mixed concrete industries followed the three featured papers on the general subject of post-war construction by Thomas Holden, Major-General Philip Fleming, and



Colonel Willard Chevalier. Robert J. Potts, chairman of the meeting, introduced each of three featured speakers from the industry, Alexander Foster, Jr., vice-president, Warner Co., Philadelphia, Penn.; A. W. Kimmel, president, Ready Mixed Corp., Dayton, Ohio, and Robert Mitchell, president, Consolidated Rock Products Co., Los Angeles, Calif.

Mr. Foster, active in both sand and gravel and ready-mixed concrete, said that in the Philadelphia vicinity and in the States of Pennsylvania, New Jersey and Delaware private industry is in a state of doubt and that it is doubtful if private industries will be in a position to expand or modernize in the period immediately after the war. The durable goods industries will have to look to public works to take their products.

When Hitler collapses there will be a reduction in war activities, particularly on the east coast and if the Federal, State and local governments are willing and allowed to give out long deferred useful projects, Mr. Foster anticipates that unemployment that would be bound to ensue would be alleviated.

Road construction would benefit the durable goods industries in the least time. While a road job of \$1,000,000 may be built in a construction season in the Eastern climate, its planning and design may require one to two and one-half years, he said. Therefore, Mr. Foster urged that plans be started at once.

Delaware contemplates \$14,250,000 for post-war work of which part is a project of 60 miles of dual highway. New Jersey has a program of highway rebuilding in the post-war period which will cost \$130,000,000, to include rebuilding one of its oldest main routes from the Delaware to the sea and considerable widening construction. New Jersey is endeavoring to have several worthwhile access roads built in 1944. The State of Pennsylvania has a program of \$500,000,000 to be expended in five years, with the projects in and about Philadelphia to cost \$43,000,000 for the construction of 50 miles of multiple-lane roads, streets and an elevated highway along the Delaware river. These Philadelphia projects will take 60,000 to 80,000 cu. yd. of concrete per year for a period of five years. Other projects planned in the three States include schools, sewerage systems, expanded water supply and other public facilities in various stages of planning.

In commenting on post-war problems, Mr. Foster discussed the possible different results from using air-entraining materials with various cements, the need for certain sand and gravel producers relocating

plants because their deposits have depleted, or building or relocating plants where the length of haul has become excessive because of large volume excavation.

Mr. Foster believes that the industry might have to face attempts by unions to get higher rates of pay when business drops off and man-hours worked are reduced. He also believes that if the War Labor Board should suddenly lose its power to control the ceiling on labor rates, the industry would be faced with many strikes.

A. W. KIMMEL, exclusively a ready-mixed concrete producer, has been taking an active part in post-war planning in Dayton, Ohio, and summarized the problems that have come up. The city has post-war programs to provide employment for returning veterans at the calculated rate of 10,000 men for each of two years.

In so far as raising money to pay

for construction is concerned, Mr. Kimmel spoke briefly on bond issues. Instead of having 65 percent of the voters approve a bond issue, an attempt is being made in Dayton to have the law changed so that 51 percent can vote a bond issue. Also, steps have been taken to have gas tax monies, diverted for other purposes by the State, made available for public works after gas rationing is ended.

ROBERT MITCHELL mentioned briefly the post-war planning activities in California. An appropriation of \$96,000 for the establishment of a Reemployment and Reconstruction Commission has been passed by the legislature. The Commission is making definite post-war plans and already has plans for 153 million dollars and the money is actually on hand and earmarked for that purpose. Also appropriated is a quarter million dollars just for the planning of public buildings.

## Post-War Prospects

THE FINAL SESSION of the annual convention of the National Crushed Stone Association in New York quite appropriately was devoted to discussion of post-war planning and prospects. A. L. WORTHEN, vice-president, New Haven Trap Rock Co., New Haven, Conn., past-president of the Association, presided. The first speaker was JAMES J. SKELLY, president, Contractors' Division, American Road Builders' Association, who stayed away from that Association's convention in Chicago on the same day in order to address the crushed stone producers.

Mr. Skelly's subject was: "Shall We Win the War Without Winning the Peace?" He made some cracks about the present administration at Washington, and the apparent fact that "once a president always a

president." He said the trouble with business men is that they want everything that is coming to them without doing their part in society. Contractors, he said, are up in arms to prevent return of anything like W.P.A. He then discussed the American Road Builders' Association plan for post-war employment in considerable detail. As this was covered in some detail in the January, 1944, issue of Rock Products, we will not repeat here.

Mr. Skelly also highly recommended the Committee for Economic Development (C.E.D.) whose work was referred to in the editorial summary of questionnaires in the same January issue. The C.E.D. provides a means of bringing all business men into the picture and impresses

(Continued on page 76)



J. R. Callanan, Callanan Road Improvement Co., with pipe, and Wilson Foss, Jr., New York Trap Rock Corporation, facing him

# CHEMISTS' CORNER

## Specifications for Portland Pozzolanas

### Part 4: Laboratory tests made of portland cements and compared with two types of processed cements to show effect of immersion in sea water and alkali water

By ALTON J. BLANK\*

A SERIES of laboratory tests have been made by the writer on a number of portland cements produced in other Mexican factories, as well as upon Landa portland cement, and the newer product, "Atoyac," by immersion in sea water. While these tests are far from complete, they can nevertheless serve as a comparison.

Briquettes of 1:3 sand were made up on all of the cements in question, one-half of each lot being made up with (a) plain drinking water and stored in plain drinking water, the

other half being made up with (b) Veracruz sea water, and stored in tanks containing sea water.

Summarizing the data in Table 8, not printed, of tests on three portland cements from Plant No. 2: sample No. 1 strength values for sea water immersion were 78 for 24 hr.,

\*Executive vice-president, Cementos Atoyac, S. A., Puebla, Mexico.

108 for three days, 98 for seven days, 87 for 28 days, and 81 for three months; sample No. 2 strength values, 84 for 24 hr., 97 for three days, 102 for seven days, 92 for 28 days, 90 for three months; sample No. 3, 130 for 24 hr., 101 for three days, 99 for seven days, 94 for 28 days, 94 for three months; the averages for the five periods being 97, 102, 99, 91, and 88, respectively.

Tests were made of eight samples of Landa portland cement, Table 9, not printed, but only three tests of the samples will be given to illustrate the results: sample No. 1, 98 for 24 hr., 92 for three days, 91 for seven days, 97 for 14 days, 101 for 28 days, and 98 for three months; sample 5, 102 for 24 hr., 93 for three days, 97 for seven days, 99 for 14 days, 88 for 28 days, and 83 for three months; sample No. 7, 108 for 24 hr., 97 for three days, 84 for seven days, 91 for 14 days, 93 for 28 days, and 93 for three months; average sea water strength values for the six periods being 101, 96, 92, 92, 92, and 88, respectively.

Eight samples of Atoyac cement also were tested, but only four will be shown in Table 10 to illustrate the results.

It is agreed that tests to age of three months are entirely too short for basing conclusions, however, it is noted that the "Atoyac" cement is somewhat more resistant to the action of sea water than are the Portland cements.

Another series of tests started by the writer involved the use of Landa portland cement and "Atoyac" cement, with the object of ascertaining the relative resistance of the two cements to the action of alkali ground water solutions.

1:3 sand briquettes were made up of each of the cements with plain water, and divided into four lots, (a) being stored in plain water; (b) being stored in a 2 percent solution of sodium sulfate; (c) being stored in a 2 percent solution of magnesium sulfate, and (d) being stored in a solution of 2 percent sodium sulfate and 2 percent magnesium sulfate.

As in the sea water tests, it is agreed that short time tests are insufficient to form true conclusions as

TABLE 7—1:3 SANDS, STRENGTH VALUES

Tests of Three Portland Cements from Plant No. 1:

Sample No. 1	24 Hr.	3 Day	7 Day	28 Day	3 Months
(a) Plain Water, Strength Val.....	100%	100%	100%	100%	100%
(b) V. Sea Water, Strength Val.....	51	74	88	94	96
Sample No. 2					
(a) Plain Water, Strength Val.....	100%	100%	100%	100%	100%
(b) V. Sea Water, Strength Val.....	110	108	97	96	91
Sample No. 3					
(a) Plain Water, Strength Val.....	100%	100%	100%	100%	100%
(b) V. Sea Water, Strength Val.....	94	83	83	82	77
V. Sea Water Ave. Strength Val.....	85	88	80	90	88

TABLE 10—1:3 SANDS, STRENGTH VALUES

Tests of 8 Samples of Atoyac Cement:

Sample No. 1	24 Hr.	3 Day	7 Day	14 Day	28 Day	3 Months
(a) Plain Water, Strength Val....	100%	100%	100%	100%	100%	100%
(b) V. Sea Water, Strength Val...	95	83	94	91	103	98
Sample No. 2						
(a) Plain Water, Strength Val....	100%	100%	100%	100%	100%	100%
(b) V. Sea Water, Strength Val...	117	81	90	94	92	92
Sample No. 3						
(a) Plain Water, Strength Val....	100%	100%	100%	100%	100%	100%
(b) V. Sea Water, Strength Val...	102	90	104	88	91	90
Sample No. 7						
(a) Plain Water, Strength Val....	100%	100%	100%	100%	100%	100%
(b) V. Sea Water, Strength Val...	124	98	93	136	111	108
V. Sea Water Ave. Strength Val..	104	91	96	98	91	96

TABLE 11—1:3 SANDS, STRENGTH VALUES.

Alkali Tests on 2 Samples of Landa Portland Cement:

Cement No. 1	7 Day	28 Day	3 Months
Stored in Plain Water, Strength Val.....	100%	100%	100%
Stored in 2% Solution Sod. Sulfate.....	108	97	94
Stored in 2% Solution Mag. Sulfate.....	101	93	87
Stored in 2% Sol. Sod. and Mag. Sulfate.....	101	92	85
Cement No. 2			
Stored in Plain Water, Strength Val.....	100%	100%	100%
Stored in 2% Solution Sod. Sulfate.....	99	100	91
Stored in 2% Solution Mag. Sulfate.....	100	98	89
Stored in 2% Sol. Sod. and Mag. Sulfate.....	93	89	83

TABLE 12—1:3 SANDS, STRENGTH VALUES.  
Alkali Tests on 2 Samples of Atoyac Cement:

Cement No. 1	7 Day	28 Day	3 Months
Stored in Plain Water, Strength Val.....	100%	100%	100%
Stored in 2% Solution Sod. Sulfate.....	124	119	108
Stored in 2% Solution Mag. Sulfate.....	104	106	100
Stored in 2% Sol. Sod. and Mag. Sulfate.....	120	123	122
Cement No. 2			
Stored in Plain Water, Strength Val.....	100%	100%	100%
Stored in 2% Solution Sod. Sulfate.....	92	106	101
Stored in 2% Solution Mag. Sulfate.....	92	110	116
Stored in 2% Sol. Sod. and Mag. Sulfate.....	101	99	104

NOTE: The same Portland cement clinker used in the manufacture of the two samples of Landa Portland cement reported in Table No. 11, was used in the manufacture of the Atoyac cement reported in Table No. 12.

to the action of alkali ground waters upon cement. However, it would appear that at early ages the Atoyac type of cement is not affected to the extent shown with the portland cement.

We have found all of the siliceous and argillaceous materials available in this vicinity suitable raw materials for the production of the Atoyac and Plastocement types of cements. It is true that some materials yield better results than others. Our reason at present for using a volcanic river sand is due to the cheapness of this material and its presence in unlimited quantities in the vicinity of our plant. We have found that certain clays do not react so well with lime in the process, but have discovered that the use of certain salts in the hydration water tend to promote desired reactions. For new cements, new specifications will naturally be required, and as I have stated several times, I feel that some distinction should be made between "processed" and "blended" cements. It is not thought that a hard and fixed rule could be adhered to as concerns a specification to cover a number of cements to be employed in a number of distinct uses, but it is thought that the present specification for portland cement could serve as a basis for other special cement specifications, providing certain changes such as definition, insoluble residue and ignition loss limitations be altered to suit the cements in question.

Strength tests, setting time, fineness and other similar clauses could be used, however, the normal consistency clause would have to be remedied inasmuch as this is not a fair test for cements of the Atoyac type. Durability could be determined as now, through long time tests in laboratory and in the field. Heat of hydration could be determined as in general practice at present. As concerns cements manufactured for use in sea and alkali ground waters, these could be tested along the lines carried out by the writer and heretofore reported. A standard test for plasticity and volume change might be found necessary, and present

methods of test might be enlarged on somewhat in fairness to all cements.

### Good Post-War Gypsum Prospects

WAR CONTROLS on civilian construction continued to have a depressing effect on the gypsum industry through 1943, but the Bureau of Mines points out that post-war prospects are excellent because of the large back-log of deferred civilian building and the probability of sizeable slum-clearance projects by the Federal government.

The reduced rate of operations from 1942 may be measured by the respective declines of 15 and 16 percent in output of domestic crude and production of calcined gypsum. Although the long-term trend in activity was downward throughout 1943, there was a marked easement in the rate of decline in both the third and fourth quarters. Demand for certain

of the prefabricated products was strong and sales of wallboard and laminated board advanced to record volumes. On the other hand, sales of the "built-in" products; plasters, lath and tile, fell far below the 1942 levels. Indicated consumption of industrial plasters increased in 1943 and, of the uncalcined products, sales of agricultural gypsum rose to record levels whereas the tonnage of portland-cement retarder fell sharply from the 1942 consumption.

### Sand-Lime Brick Production and Shipments

FOUR active sand-lime block and brick plants reported for January and three for December, statistics for which were published in February, 1944.

#### AVERAGE PRICE FOR JANUARY

	Plant Price	Delivered Price
Detroit, Mich. ....	.....	\$16.00
Saginaw, Mich. ....	\$15.00	.....
Grand Rapids, Mich. ....	.....	15.00
Seattle, Wash. ....	19.50	21.50

#### STATISTICS FOR DECEMBER AND JANUARY

	*December	†January
Production .....	1,208,060†	1,218,600
Shipments (rail) ...	35,000	281,000
Shipments (truck) ..	998,000†	793,600
Stocks on hand.....	608,000†	607,000
Unfilled orders .....	1,250,000†	1,200,000

\*Four plants reporting: incomplete, one not reporting stocks on hand and two not reporting unfilled orders.

†Figures include report from one plant for January, 1944.

‡Four plants reporting: incomplete, one not reporting stocks on hand and two not reporting unfilled orders.

#### GYPSUM AND GYPSUM PRODUCTS IN THE UNITED STATES, 1943

	1943, Tons	1942, Tons	% Change from 1942
Crude gypsum mined <sup>1</sup> .....	3,918,559	4,634,335	-15
Calcined gypsum produced <sup>2</sup> .....	2,563,819	3,060,026	-16
Gypsum products sold or used: <sup>3</sup>			
Uncalcined uses:			
Portland-cement retarder .....	859,914	1,209,892	-29
Agricultural gypsum .....	376,864	230,900	+63
Fillers and unclassified .....	18,942	17,501	-9
Industrial uses:			
Plate-glass and terra-cotta plasters... ..	20,000	18,615	+7
Pottery plasters .....	94,782	29,376	+18
Dental and orthopedic plasters.....	* 14,750	* 9,827	+50
Other industrial uses .....	* 93,944	* 86,732	+8
Building uses:			
Plasters:			
Base-coat .....	527,684	857,275	-38
Sanded .....	71,567	101,400	-29
To mixing plants.....	24,906	18,715	+33
Gauging and molding .....	73,940	106,522	-31
Prepared finishes .....	4,402	8,994	-51
Insulating and roof-deck .....	44,842	48,266	-8
Other building plasters .....	13,410	12,031	+11
Keene's cement .....	8,019	14,848	-46
Lath, M sq. ft. ....	630,612	959,719	-34
Wallboard, M sq. ft. ....	1,241,991	* 1,094,445	(*)
Sheathing, M sq. ft. ....	232,794	369,988	-37
Laminated board,* M sq. ft. ....	203,827	(*)	....
Tile, M sq. ft. ....	11,637	* 24,639	-53

<sup>1</sup> Excludes by-product gypsum.

<sup>2</sup> Includes by-product gypsum.

<sup>3</sup> Revised figures.

\* Revised; includes laminated board as component board.

\* Data not comparable.

\* Reported as area of component board and not of finished product.

\* Data included under "Wallboard."

\* Revised; excludes laminated board products.



# LIME FORUM

## Compare High and Low Kiln Efficiency

Kiln efficiencies analyzed to show  
the possibilities for improvement

By VICTOR J. AZBE\*

As much as possible, performance of everything should be evaluated by comparison to some standard. Ordinarily kilns are compared to the theoretical ideal although it is better to compare them to a practical ideal. In the case of a rotary kiln it probably would be even preferable to compare them with the possible worst, rather than the possible best, as after all the majority of the kilns are far nearer the worst than they are the best, and for one to find himself so close to the standard of the worst may act in an awakening manner.

### Example of Low Standard Performance

As our example, we will take a powdered coal direct-fired kiln, but the reasoning will apply as well to any other rotary kiln, excepting such as are fired with producer gas which have certain losses inherent in that sort of operation, which are not here considered.

The poorest rotary has no lime cooler, or it has a cooler wasting recovered heat. The terminal temperature of escaping gases is 1500 deg. F., or would be this, if determined correctly and combustion would be complete within the kiln and not extend into the settling chamber. If combustion is complete the stack loss is further augmented by a certain amount of excess air.

The heat energy is of high, as well as of low intensity. The dissociation temperature of limestone is the division point; this varies with CO<sub>2</sub> concentration adjacent to and permeating the lime layer on the stone. On the average, with small stone in a rotary kiln, it will be less than with large stone in a vertical kiln. To assume a temperature of 1500 deg. F., should be fairly safe.

If escaping gas temperature from a kiln is 1500 deg. F., and the dissociation point is 1500 deg. F., then all the heat in preheating the stone came from the high intensity portion, meaning that none of the heat of low intensity was, or could be, utilized. Also the source of heat radiated from the shell all the way to the end was from the high intensity portion.

There would be no recuperation and no regeneration; all the sensible

heat in the lime would go to waste, all heat below 1500 deg. F., in the gases would go to waste, excess air would further waste heat from the high intensity stream, also from radiation in a rather considerable amount.

The whole picture of the low standard kiln seems overdrawn, but it is not. Some kilns operate precisely like this, and many are very close to it. To prove this their fuel—lime ratio need only be compared with that developed here.

The fuel is good high grade 14000 B.t.u. coal, but percentages here given would apply to coal of any heat value and, roughly, also to oil.

Heat in coal can be divided into three portions: "Unavailable"—which represents latent heat of water vapor; "High Intensity"—about 1500 deg. F., and "Low Intensity"—below 1500 deg. F.

### HEAT DISTRIBUTION FROM ONE POUND OF COAL

14,000 B.t.u. = 100%	B.t.u.	%
"Unavailable" due to latent heat of H <sub>2</sub> O.....	730	5.14
"Low Intensity" below calcination temperature	4580	32.74
"High Intensity" above calcination temperature	8690	62.12
	14000	100.00

In any kiln the 5.14 percent portion would be lost, in such a kiln as we are now contemplating the 32.74 percent would also go to waste and, in addition, the following amount of the 62.12 percent portion.

### "HIGH INTENSITY" HEAT DISTRIBUTION

Total Available 8690 B.t.u. = 62.12%	B.t.u.	%
Excess air loss (20% excess air) .....	847	6.03
Radiation loss (15% of total heat) .....	2100	15.00
Total of high intensity heat loss .....	2947	21.03
Total of high intensity heat remaining .....	5743	41.09

Next we determine the amount of heat necessary to preheat and calcine one pound of lime. Under these conditions all such heat will be derived from the "High Intensity" portion and dividing the heat available (5743

B.t.u.) by the heat required per pound gives the attainable fuel ratio.

### HEAT NECESSARY FOR CALCINATION AND PREHEATING FOR ONE POUND OF LIME

Preheating of CO <sub>2</sub> portion of limestone to 1500° F.....	390 B.t.u.
Preheating of CaO portion of limestone to 2400° F.....	620 B.t.u.
Heat of calcination reaction to CaO at 1500° F.....	1220 B.t.u.
Total heat of preheating and calcination .....	2230 B.t.u.
Lime-fuel ratio	5743 B.t.u. / 2230 B.t.u. = 2.57 — 1

This 2.57—1, or 72 gal. of oil per ton of lime, may be considered tops in poor performance and many kilns come very close to it, as a ratio of 3—1, or an oil consumption of 63 gal. are common.

Why their ratio is 3 to 1 rather than 2.57—1 is because lime is not 100 percent CaO, so actually a bit less heat is necessary than was assumed, also because some of the heat in the lime may be recovered in the last few feet of the rotary and some of the "low elevation" heat utilized for stone preheating as also radiated from kiln shell, in place of the heat of "high elevation."

### High Standard Performance

Now that the "Low Standard" has been established and the basic reason therefor, it would be of interest to develop the "High Standard." We will assume the same heat division between high and low intensity portions, also the same loss due to water vapor, excess air, and radiation. We will merely manipulate heat requirements for lime making in accordance with the prevailing conditions, full cooling of lime for one, and full cooling of lime plus full preheating of stone with low intensity heat for the other.

Assuming first that the kiln gas temperature would still be 1500 deg. F., but that the kiln was equipped with an efficient lime cooler, fully recovering sensible heat of the lime and returning all of it to the kiln. Heat necessary for calcination and preheating per pound of lime would then be:

Calcination reaction at 1500 deg. F. ....	1220 B.t.u.
Preheating of CaO portion of lime (all returned by cooler) ....	

\*Consulting Engineer, St. Louis, Mo.

Preheating of CO<sub>2</sub> portion of limestone ..... 390 B.t.u.

Total heat abstracted from high elevation heat stream 1610 B.t.u.

As all sensible heat of lime is returned to the kiln, none can be charged for, but as all of it came from the high intensity portion, there is no credit. Fuel ratio is increased but not in the measure possible when stone is preheated with waste heat.

Supposing next, that this is the case, all of stone preheating is with heat of low elevation and all sensible heat in the lime is recovered and returned to the kiln. The total high heat requirement per pound of lime would then be:

Calcination reaction at 1500 deg. F. .... 1220 B.t.u.  
Preheating of CO<sub>2</sub> portion of limestone (recuperative) .. ....  
Preheating of CaO portion of limestone (credit) ..... 390 B.t.u.  
Total heat of High Elevation 830 B.t.u.

The strange and most interesting thing here is that through preheating followed by cooling, we recover low intensity heat and recuperate it in the cooler to high intensity and thus accomplish a most remarkable saving.

Summarizing the three conditions we obtain:

	B.t.u. per lb. of Lime	Fuel Ratio
A: High Heat Stone Preheating, no lime cooling	2230	2.57
B: High Heat Stone Preheating, fully effective cooling	1610	3.57
C: Low Heat Stone Preheating, fully effective cooling	830	6.92

### Schematic Design for Economy

The "high standard" has a ratio of practically 7—1, but it is not obtainable through any rotary in itself, but is approachable only when it is augmented by an effective cooler and stone preheater, for example, as illustrated by Fig. 1.

The main features of this Azbe plan of rotary kiln operation are:

1. A direct contact lime cooler, as only through intimate contact of lime and air can lime be effectively cooled. The cooler incorporates special arrangements for air distribution and dust interception.
2. A direct contact stone preheater with gas intake and offtake, very much on the order utilized for many years in stone preheating sections of vertical kilns.
3. A twin system of powdered fuel injection, one arranged for dispersion of fuel stream and short flame, the other intended for projection and long flame.

4. High strength CO<sub>2</sub> recirculation for tempering of flame with a source point equal to the vertical kilns.

5. Induced draft operation attained with preheater fan.

6. A heavy outlet construction to increase kiln load, time of lime in the kiln and upper heat absorbing surface.

7. A stone screw to permit heavy feeding with no back-spilling.

When efficiency is high, temperature is high and as there are refractory limitations the double system of burning was incorporated. Of the two fuel injectors, the one for far projection carries most of the fuel, while the second is used to regulate the quality of the outpouring lime in relation to its calcination. Such a double system will lengthen out the ordinarily very short hot zone and reduce its peak temperature, and thus reduce the tendency to scale and ring formation. Additional heat control can be obtained by injecting CO<sub>2</sub> high gases.

The arrangement calls for only part of the kiln gases passing through the stone preheater; such part as it is necessary to preheat the stone to 1500 deg. F. They may pass out at either of the two levels, this depending on size of stone, or the stream may come out divided to both.

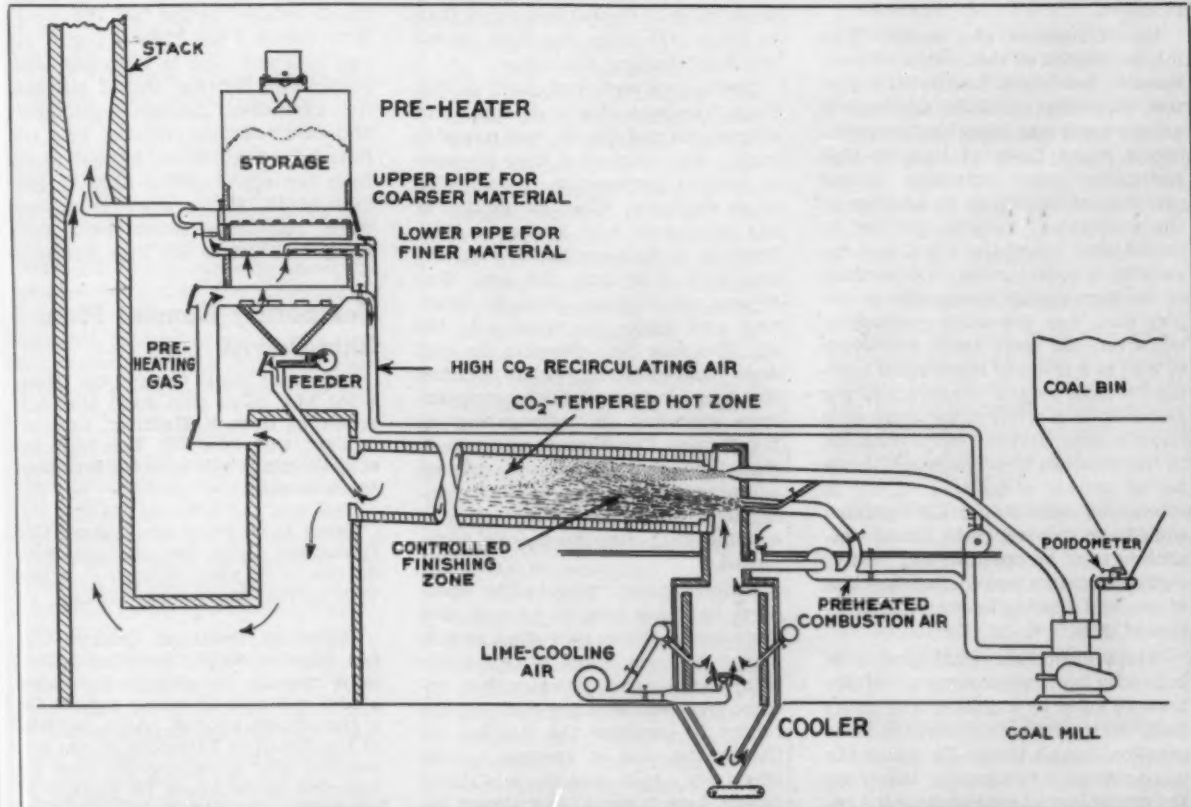


Fig. 1: Rotary kiln equipped with a direct contact lime cooler and stone preheater with gas intake and offtake

# Rock Dusting Coal Mines

## Disgraceful How Few Mines Practice It

**P**RODUCERS of limestone and gypsum dust for rock dusting coal mines to prevent explosions will find Information Circular 7181, U. S. Bureau of Mines, by Dan Harrington, the best piece of sales promotion literature they can obtain. The title is "Status of Safety in Mining." The text covers a very complete analysis of coal mine accident experience covering several years.

The author states: "Only 7 to 8 percent of the coal mines of the United States (400 to 500 of the approximately 6,000 coal mines in the United States) make any claim to using rock dust, and a very fair assumption is that not even 1 percent are at all adequately rock-dusted. This is a sad commentary on the attitude of by far the majority of the membership of the coal-mining industry toward trying to safeguard not only the lives of the workers but also the property of the company, as adequate rock-dusting can be maintained in almost any coal mine in the United States for 1 to 2 cents per ton of coal produced.

Mr. Harrington also states: "The mechanization of coal mines unquestionably introduces additional explosion and other hazards, although it affords numerous opportunities to decrease many types of hazards that accompany more primitive mining practices and methods. In addition to the mechanical hazards involved in mechanized mines, there is almost invariably a considerable concentration of workers readily susceptible to injury from any untoward occurrence; moreover, the more rapid extraction of coal as a result of mechanical loading liberates greater quantities of gas and dust in a given period than does hand loading, and the gas is liberated in the presence of an increased number of sources of ignition, chiefly in connection with electrically operated equipment. Consequently, better ventilation must be provided and greater vigilance maintained in the detection of gas and elimination or neutralization of dust.

"Many explosions result directly or indirectly from carelessness or infractions of rules by employes and many from unsafe methods, installations, or practices (or all three) for which the management is responsible; therefore, the prevention of explosions is the responsibility not only of the manage-

ment but also of the workers. Irrespective of responsibility, there is no question as to the seriousness of the situation brought about by the very bad coal-mine disasters of the past 3½ years (including the Mulga disaster of October, 1937); and all persons engaged in coal mining, especially those trying to reduce accident occurrence in the coal mines of the United States, are now confronted with the difficult problem of trying to equal the exceptionally good record of the fiscal year 1939, when no major explosions occurred.

### Cold Weather Hazard Greatest

"During the winter the cold air entering mines absorbs moisture and dries the coal dust, making it more capable of being raised into the air, more readily ignited, and more violently explosive upon ignition; and during these months particular precautions should be taken to prevent accumulations of explosive gas or dust and the initiation of an explosion. This applies even more emphatically to our modern mechanized mines than to those still using the most primitive hand-loading methods.

"Pulverized rock dust, such as that from limestone, should be applied in bituminous and lignitic coal mines to walls, roof, and floor of mine passages to prevent propagation or extension of an explosion. When an ignition of gas or of pure coal dust or a combination of both occurs, this pulverized rock dust and the coal dust present on adjacent surfaces (floor, roof, and walls) are raised into the air. The rock dust prevents the coal dust from igniting, which localizes the flame and prevents the explosion from spreading, or "propagating" as it is termed. Experiments and experience have shown that an explosion will not propagate or extend any considerable distance from its origin in a mine that has been well rock-dusted.

Unfortunately, most mine operators have not seen fit to rock-dust their mines, others have done so only partly, whereas many an efficiently rock-dusted mine of today has become inefficient in a few days through failure to continue the dusting, although the cost of keeping a mine effectively rock-dusted is trivial (about 1 or 2 cents, and almost invariably less than 3 cents, per ton of

coal produced). The partial rock-dusting of mines gives little or no real protection; in fact, it fosters a false sense of security, and in many instances the result is even worse than if no rock-dusting were done. To provide adequate assurance against widespread explosion disasters in coal mines all accessible open areas should be thoroughly rock-dusted, including haulage entries, air-courses, rooms, crosscuts, short or long faces, and pillar regions; and the rock-dusting should be repeated from time to time so as to hold the incombustible content of the rib, roof, and floor dusts at all times to over 65 percent. It is a certainty that fewer than 5 percent (probably not more than 1 percent) of the coal mines of the United States are adequately or efficiently rock-dusted.

"The marked increase in explosion fatalities during the past year spoils an excellent record that had been maintained during the previous 7 to 9 years; and there is reason to believe that unless our coal-mining people awoken to the fact that coal-mine disasters are likely to occur unless constant care is exercised with ventilation, lighting, use of electricity, explosives, haulage equipment, and other factors entering into the initiation of explosions, we shall again have the reprehensible disaster records of 10, 20, or more years ago, when coal-mine catastrophes normally took 300 to 500 lives annually.

### Temporary Cement Plant Shut-Downs

UNIVERSAL ATLAS CEMENT CO., Hannibal, Mo., plant shut down March 1, according to R. E. Hoffman, superintendent, with bins full. It is expected that the plant will be down for about three months.

SANTA CRUZ PORTLAND CEMENT CO., Davenport, Calif., has curtailed production at its plant to bring it in line with current market conditions.

MONOLITH PORTLAND CEMENT CO., Los Angeles, Calif., curtailed operations recently but expects to resume on full schedule to supply cement for a big airport project. At a meeting of the Board of Directors, it was announced that operations this year are expected to be about 50 percent of productive capacity, states a local report.



# MAINTENANCE

## Leaves From An Operator's Notebook

### Part 1: Practical suggestions for equipment installation and maintenance in a cement plant

THESE NOTES are just exactly what the title says. They were made in anticipation of writing a text-book. There is no continuity. They are thoughts just as jotted down by an experienced cement-plant superintendent.

#### Quarry Repair Parts

The quarry is usually too vital a part of the plant to permit shutting down for any length of time. Also, there is usually only one of a kind of the larger machines, for instance, the main incline hoist, the primary crusher and sometimes the secondary crusher. On this last, it has become more common to have two or even more machines to get a fine product which eases the raw preliminary grinding, but a major breakdown of any of the other above machines may mean a shutdown of the plant for weeks or even months.

The parts are special, heavy and intricate, and delivery is slow. This is therefore one of the places that well repays a relatively heavy investment in repair parts.

In a large New York State mill an anvil block in a single-roll crusher broke so it could not be repaired. Every effort was made to speed the renewal but it was over a month before a new block was purchased and installed. Meanwhile the rock in storage ran out and the plant was down over two weeks in the busiest season.

#### Labor

The seniority system results in a form of serfdom, where a man can not quit his job if he has any seniority. In the new job he will be "last on," which can be said another way "first off" when curtailment comes. The labor turnover becomes unbelievably small.

Another result is that craftsmen get experience only in the plant they start in. They can not afford to travel around, as this gets them only the poor jobs where nothing is learned, the pay poor, and the layoffs frequent. Security is not all joy to the employee.

#### Mill Room Design

Tube or ball mills should have the shell not less than 40-in. above the floor. Somewhat more is preferable. The loads must be dumped from time to time, and this allows room to dump by opening the manhole and turning the mill.

Setting the mill high (over 60-in. from shell to floor) has no real advantage if care is taken to prevent workmen from getting near the mill.

#### Electric Motors

A great help in disassembling electric motors is a split end bell on the

pulley end. The pulley, gear, or coupling should be mounted tightly on the shaft, preferably with a light press fit. It is difficult to handle such a fit, particularly in dismounting, if the end bell is not split, and motor ball bearings are often injured in removing and replacing tight pulleys, etc. If the end bell is split it is often not necessary to remove the pulley, etc., and it is much easier done if it is necessary.

#### Kiln Nose Economics

These notes are based on a 11-ft. diameter cement kiln, wet process.

1. Cost of tight kiln end. = \$7000
2. Cost of "fairly open" kiln end = 3000

Each lasts three years, difference = \$4000  
4000/3 = \$1334 per year  
1334/330 = \$4.04 per day  
With coal at \$6 per ton, pulverized, this would be 1347 lb. of coal per day.

This kiln produces 1700 bbl. of clinker per day. The tight kiln end should therefore save, over the "fairly open" end, 1347/1700 = 0.8 lb. of coal per bbl. of cement; 0.8 lb. of coal is big enough to find.

#### Crane Maintenance

Cranes run best when the wheels are tapered much like a standard railway car wheel. A taper of  $\frac{3}{4}$  in. per ft. on diameter gives good results. The tread must be wide enough so that the flanges will not come against the rail.

The flanges should act as safety precaution only, the wheels running against the rail on the tapered tread only. A hard tread surface is necessary to keep the shape, which means chilled wheels or preferably deeply ( $\frac{1}{2}$  in. to  $\frac{3}{4}$  in.) case-hardened steel wheels.

#### Packaging Bagged Cement

Bagged cement is sometimes packed in paper cartons for sea shipment. Corrugated cardboard cartons 23 in.

(Continued on page 63)

#### Introduction

• THE AUTHOR of these notes is the late T. N. Haffner, at the time of his death in 1942, superintendent of the Keystone Portland Cement Co. Mr. Haffner was preparing a text-book on Cement Manufacture, but had got no farther than some rough notes. These, his widow, Vorha B. Haffner, M. D., has submitted to us.

After much deliberation we have decided to present some of this material in just about the form it is in—"Leaves from an Operator's Notebook." Hence the articles may appear disconnected. However, they do contain the result of much practical experience, and we are convinced will prove both interesting and helpful to other operators.

We realize that it is a bit unfair to the deceased author to present this material without his ever having had a chance to check and verify some of the data given, and we ask readers to keep this in mind in any critical attitude they may take.

—The Editors.

# Maintenance of Air Compressors\*

Proper and Not Excessive Lubrication Is All Important

**L**UBRICATION of air compressors involves the complex problem of selecting the proper oil for the part to be lubricated and in seeing that the oil is properly applied and in the proper amount.

The first rule to be followed in the proper lubrication of compressors or any other machinery is to use oil according to any special specifications which may be prescribed by the compressor manufacturer, and then deal with a reputable oil company that is willing to guarantee a lubricant of maintained specification that is satisfactory for the service for which it is intended.

As many as three different types of oil may be required by a reciprocating compressor; one type for the compressor cylinders, another for the bearings of the driving gear, and a third for the power cylinders, provided the source of power is steam, oil engine, or gas engine.

Oil intended for compressors of the single-acting trunk piston type must be suitable for both the compressor cylinders and the running gear, and must be of the type known as compressor cylinder oil with specifications suitable for the particular machine. Double-acting piston type compressors; in which the frame running parts and the compressor cyl-

inders are completely separated, require cylinder oil for the compressor cylinders and crankcase or bearing oil for the running gear (see Fig. 1).

Compressors vary so widely as to type and use as to make it impossible to prescribe an oil specification that would be completely suitable for every condition. The following specifications for compressor cylinder oils are taken from the Trade Standards of the Compressed Air Institute, which would apply generally to most air compressor installations. These are:

Flash point... 350 deg. F., minimum

AMOUNTS OF LUBRICATING OILS REQUIRED BY DIFFERENT SIZES OF AIR COMPRESSORS

Cylinder Diameter—Inches	Piston Displacement per Cylinder cfm.	Swept Surface per Cylinder, Square Feet per Minute	Oil Feed Per Cylinder	
			Drops per Minute	*Pints per 10 Hours
Up to 6	Up to 65	Up to 500	2 d. in 3 m.	0.05
6 to 8	65 to 125	500 to 750	1	0.075
8 to 10	125 to 225	750 to 1,100	4 d. in 3 m.	0.10
10 to 12	225 to 350	1,100 to 1,500	1-2	0.112
12 to 15	350 to 600	1,500 to 2,000	2-3	0.188
15 to 18	600 to 1,000	2,000 to 2,600	3-4	0.262
18 to 24	1,000 to 1,800	2,600 to 3,600	4-5	0.338
24 to 30	1,800 to 3,000	3,600 to 4,800	5-6	0.412
30 to 36	3,000 to 4,500	4,800 to 6,000	6-8	0.525
36 to 42	4,500 to 6,500	6,000 to 7,500	8-10	0.675
42 to 48	6,500 to 9,000	7,500 to 9,000	10-12	0.825

\*Figures in last column are based upon 8,000 drops per pint at 75 deg. F.

Viscosity S.S.U. at 100 deg. F....

.....245 minimum

Viscosity S.S.U. at 210 deg. F....

.....45 minimum

Pour point... plus 35 deg. F., maximum

Neutralization Number .....

.....0.10 maximum

Conradson carbon residue.....

.....2.0 percent maximum

As stated above, special requirements call for special treatment. If the cooling water is of a much lower temperature than the incoming air, condensation is formed on the cylinder walls, with resulting poor lubrication. The answer in such cases may be to heat up the cooling water to more nearly the temperature of the intake air (see Fig. 2). The ratio of the initial and final pressures developed in cylinders has an important bearing on the oil selected, as this in great measure determines the maximum temperature prevailing in the cylinder. The size and the speed of the compressor also has a considerable influence on the discharge temperature of a compressor cylinder.

The amount of oil required in a compressor cylinder will vary somewhat with the type of machine, its speed, and local conditions of operation. It is good practice to use oil liberally while the machine is new and until the cylinders have been glazed. The quantity of oil should then be gradually reduced, using care to examine the cylinders occasionally by removing a valve to ascertain

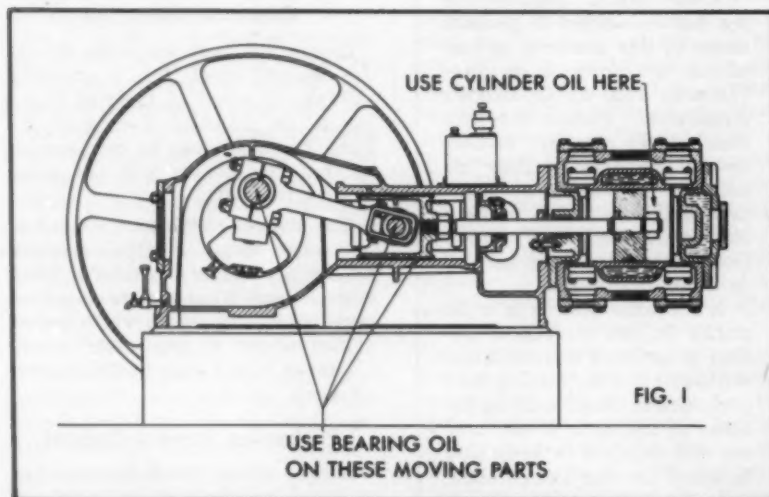


Fig. 1: Compressor cylinders require cylinder oil and the running gear, crankcase or bearing oil

whether the walls are amply coated with oil. Provide an ample amount of oil, but do not overlubricate, as an excessive amount of oil in the discharge is very undesirable and to be avoided. The following table gives the minimum allowable rate of feed under ideal operating conditions, but the use of this table should be amplified by frequent examinations of the cylinder walls as previously stated.

Steam cylinder oil may vary appreciably, depending upon steam temperature. For moderate steam temperatures, the following specification is submitted as taken from the Trade Standards:

Flash point—...500 deg. F., minimum  
Viscosity S.S.U., at 210 deg. F....  
.....Seldom less than 100  
Pour point....80 deg. F., maximum  
Conradson Carbon residue left on evaporation.....4.5 maximum  
Compounding .....

.....0 to 12 percent maximum  
Entirely different considerations are required for the lubrication of both rotary compressors and centrifugal compressors and exhausters. Most of the different types of rotary compressors and vacuum pumps employ different lubricating specifications. It is important to follow the instructions of the manufacturer carefully.

Centrifugal compressors and exhausters require bearing lubrication only, and in overhung units that have no bearings of their own, only the

driving mechanism is lubricated. Ball or roller type anti-friction bearings on small pedestal or multi-stage units require grease or oil in the usual manner. Larger and higher speed units generally have pressure lubricated sleeve bearings. Consult the manufacturer for recommendations.

## Cement Plant Maintenance

(Continued from page 61)

long x 17 in. wide x 5½ in. high will accommodate one bag of finely ground cement (2500 surface area) and may be slightly smaller for coarser cement.

The carton may cost from 25c to 30c each. Special glue for containers, applied cold, is best applied by automatic machines, but may be applied manually for small amounts of such packaging. The cost of manual packaging may run from 20c to 40c per bbl. for labor alone.

## Conveyor Belts

There is no cheaper method of conveying crushed rock, coal, gypsum rock or cool clinker than by conveyor belts. They combine simplicity, dependability, high efficiency and reasonable first cost, and can be adapted readily to discharge at various points as well as at the end pulley. Practically anything which is not sticky can be carried on a horizontal or an incline and even bulk cement has been transported by belts.

For obvious reasons the latter use is going out, but a horsepower ex-

ended in carrying cement 500 ft. by compressed air will carry the same cement a mile on a conveyor belt.

Operation and maintenance costs are low, as there is very little to do with the belt once it is properly installed. Anti-friction idlers (ball or roller) should be used as they require lubrication not oftener than once in three months and are more economical of power than sleeve bearings.

Do not have tripper at end of long line. Do not use tripper with small pulleys. Do not use side guides.

The following "Suggestions for Training Conveyor Belt" attached to Mr. Haffner's manuscript on a type-written sheet may not be original. Possibly it was supplied by the belt manufacturer. Anyhow, it is good.—The Editors.

## Training Conveyor Belt

1. (a) All pulleys to be **SQUARE** and **LEVEL**. (b) Idlers **LEVEL** and **SQUARE** and tipped **FORWARD** 2 deg. (c) Belt **STRAIGHT** and **SPLICED SQUARE** and **TROUGHING** properly. (d) No bolt heads or interferences liable to tear belt on return runs or around pulleys.

2. (a) Station men at each end and along system at intervals sufficient to watch entire belt. Provide flashlights if necessary. Arrange warning signal to use if belt gets in danger of interference. (b) Start belt carefully, run a few feet, stop it and inspect for tendencies to run off anywhere.

3. Remember, if belt runs off: (a) It is those idlers over which the belt has *already* passed which cause it to go out of line. (b) In correcting idler positions it only makes for confusion to correct at many points *simultaneously*. Unless several **OBVIOUSLY** bad spots exist, it is better to correct *progressively* by going around the system in the following order: Start from drive pulley, work along return strand, to and around foot pulley and along top strand back to drive. Correct worst point first. (c) After each occasion for stopping belt, make sure belt is entering Drive Pulley in center position. Lift it into position if necessary.

4. Start belt again after correcting idler positions and repeat as in Nos. 2 and 3.

5. Repeat No. 4 until belt can safely be left running.

6. Then train idlers without stopping belt. Remember the cautions in No. 3. Continue training until belt runs straight and true. Allow it to run for one or two hours under ob-

(Continued on page 74)

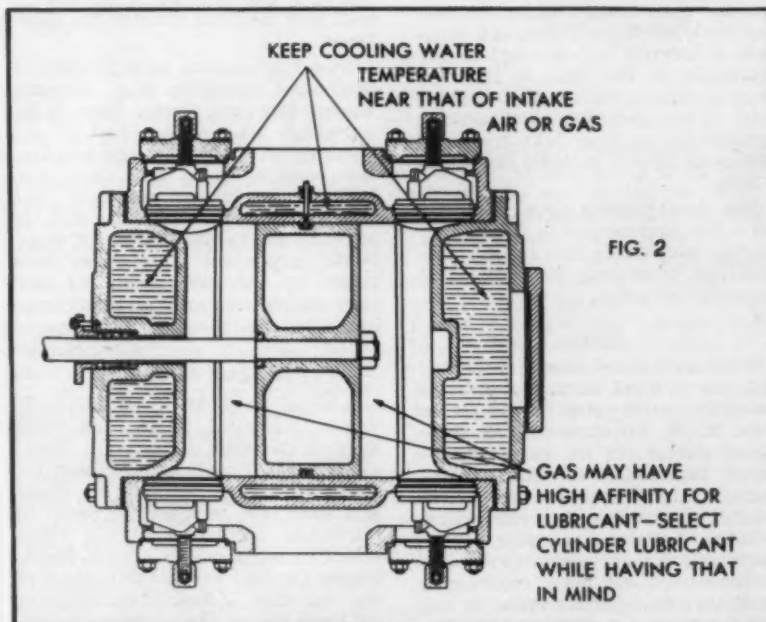


Fig. 2: Temperature of cooling water should be as close to temperature of the air or gas in the compressor as possible, to minimize the condensation on the cylinder walls



## STRATEGIC MINERALS

American Institute of Mining and Metallurgical Engineers convention papers emphasize minerals in the war effort and post-war possibilities

**M**ANY of the subjects covered at the annual meeting of the American Institute of Mining and Metallurgical Engineers, New York City, February 20-24, were too highly technical in character for many readers of *Rock Products*, but something of practical interest could be gleaned from most of the papers at the Industrial Minerals Division sessions. Some of the papers on flotation and magnesalium presented in meetings of other divisions are abstracted later in this report, from the viewpoint of their value to producers of non-metallic minerals.

OLIVER BOWLES, U. S. Bureau of Mines, in the first session, briefly summed up status of the nonmetallic minerals, emphasizing new products and developments, in his paper "Non-metallic Minerals Speed the War." Most of his summary was published in the February, 1944, issue of *Mining and Metallurgy*, and reprints of that article were distributed.

### War Uses for Minerals

An imposing list of applications of non-metallic minerals to war usage was given. Among the newer developments mentioned in his paper were the completion of a new lightweight aggregate plant at Bradenton, Fla., using bentonite for raw material, to produce aggregates for use in making concrete ships; and the manufacture of lightweight slag from waste slate by the Funkhouser Co. at Delta, Penn. In the latter process, pulverized slate is mixed with binders and organic matter, made up into pellets and calcined at about 2300 deg. F. The product is highly porous and is applied to the manufacture of lightweight concrete slabs.

Mica continues to be high on the critical list, he said. Barites have come into use in the manufacture of primers, tracer bullets and signal flares. One of limestone's chief contributions to the war effort is in the manufacture of calcium carbide for making synthetic rubber. There were 30,000,000 tons of limestone utilized for metallurgical flux in 1943 and 1¼ million tons of dead-burned dolomite refractory materials, he said. Mention was made of wartime uses of limestone with great potentialities, in the aluminum program. One use, for a high-

By BROR NORDBERG

grade limestone with less than 1 percent silica, is in the recovery of alumina from waste mud accumulations.

Dr. Bowles mentioned the declines in shipments of portland cement and aggregates but spoke encouragingly on the prospects for railroad ballast, postwar building and the present farm market for non-metallic minerals. Agricultural limestone production will break all records in 1944, he said, and there will be a demand for 8,000,000 tons of superphosphates; far surpassing the 1943 record year.

New developments in fluorspar were mentioned, particularly with reference to flotation, and it was announced that three concerns are adding equipment to apply the ferro-silicon heavy-media process for the separation of fluorspar from gangue, on a commercial scale.

Special war uses for mineral wool, such as for blankets for hut construction in Alaska, for protection against extreme cold in high-altitude bombing, were mentioned. Through flotation, a superior talc product is now obtainable in the East to take the place of foreign sources now unavailable. It was necessary to obtain talc suitable for making high-frequency insulators needed in radio communications.

The developments here given are but a few summarized in Dr. Bowles' reprint, which goes into considerable detail for practically all nonmetallic industrial minerals.

### Mica

There were three papers concerned with the mineral mica, but most of the information referred to sheet mica. H. M. BANNERMAN, U. S. Geological Survey, in his paper, "Geological Exploration for Mineral Deposits of the Pegmatite Type," told some of the results of investigations, including geological mapping of deposits and mines, prompted by the wartime need for mica spodumene, beryllium and other minerals. It has been substantiated that mica of strategic value comes mainly from plagioclase zones, not from complex dikes.

CAPTAIN R. G. WAYLAND, U. S. Army, discussed the qualities of mica of interest to the Army, trends in the foreign supply and domestic mining trends. A paper, "Mica Distribution in Western North Carolina Pegmatites," by J. C. Olson, J. M. Parker, III and J. J. Page, U. S. Geological Survey, covered the relationships of the grade and quality of mica to the various structural types found. The most productive types are shoots adjacent to the walls, streaks centrally located within the pegmatite, uniformly disseminated deposits in small lens-like pegmatites, and concentrations along massive quartz bodies. A paper, "Characteristics of Some New England Mica-Bearing Pegmatites," by E. N. Cameron, D. M. Larrabee, A. H. McNair and G. W. Stewart, U. S. Geological Survey, covered the structural and production characteristics of the five types of deposits recognized in Connecticut and New Hampshire. They are the wall zone type, quartz core, quartz pocket, flash-joint and disseminated. Tonnage of rock to be removed for recovery of a ton of mica is far less, in wall zone deposits, than in the other types.

In a joint session with the Mining Methods Committee, B. C. BURGESS, Mining Engineer, Spruce Pine, N. C., presented his second report to the Institute on the mining and preparation costs of mica. Less than one-half of the known prospects have been developed to date, he said, in spite of the critical status of mica. While prices for mica have been raised by the government, he said they are still too low and many mine operators are operating at a loss.

### Roofing Granules

A paper by R. M. FOOSE, Pennsylvania Geological Survey, on "The Roofing Granules Industry in Pennsylvania," was particularly interesting since Mr. Foose showed flowsheets and went into considerable detail in discussing operations at the Delta and Charmian plants of the Funkhouser Co. and the Gladhill plant of the Advance Industrial Supply Co. All three plants are in Pennsylvania.

At Delta, Penn., a slate quarry is being excavated on a 50-ft. face. The

face is drilled and blasted, using 1- to 1 1/4-in. drill holes 10 ft. in depth, and an electric shovel loads into cars which are hauled 2500 ft. to the plant. In addition to the quarry face excavation, drifts are also being worked. All the drilling is done wet.

The first step in processing is passage of the slate through a gyratory crusher, followed by screening and the further reduction of plus 2- in. material through a hammer mill. Further reduction is accomplished, after drying, through another hammer mill and crushing rolls, with several intermediate screening operations over electric vibrating screens. The final product is that retained between 8- mesh and 35- mesh screens. An interesting observation made was that one ton of dust is produced for every ton of granules. A separation of the dust is made and the fine product is sold for mine dust.

At Charnian, a greenstone deposit is being worked, and colored granules are being produced. Excavation is done by shrinkage stoping in drifts at this plant. Skips deliver the stone to a gyratory crusher. Further reduction is accomplished through a cone crusher and the rest of the operation consists of several stages of reduction through roll crushers with intermediate screening operations.

White quartzite is used in the production of colored granules. The operation consists of the application of the coloring pigment and firing in a rotary kiln at approximately 1300 deg. F., followed by cooling in a water-cooled drum. According to Mr. Foote, granules of various colors will endure five years of exposure without fading. After that, any fading would be uniform.

At Gladhill, Penn., most of the quarried rock is greenstone, but a purple rhyolite is taken from one quarry. The plant is a gravity operation, on the side of a hill. Crushing and screening operations bring the product down to a size passing a 9-mesh screen opening and retained on 34- mesh. Granules are re-screened before they are shipped.

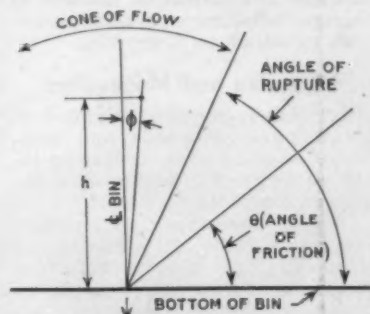
#### Bin Flow

S. M. SHALLCROSS, Warner Co., Philadelphia, in a paper "Flow of Granular Materials in Bins," summarized experimental work that he has done to determine the law of flow of materials in fine masses, that led to his development of an empirical formula to govern the flow of any granular material in bins.

The accompanying sketch is reproduced herewith to show some of the factors considered in the development of Mr. Shallcross' formula.

Granular materials were defined, for the purpose of his discussion, as materials having a constant coefficient of friction (not compressible), without variations in moisture. The angle

of friction for most materials is about equal to the angle of rest, he said. The friction angle, shown on the sketch, is the angle, with its tangent equal to the coefficient of friction. The angle of rupture (see sketch) is



Showing the factors entering into development of empirical formula for bin flow of granular materials

determined by bisecting the angle between the vertical and the angle of friction line and is the basis on which engineers figure horizontal pressures against retaining walls, said Mr. Shallcross. The angle of flow is the complement of the angle of rupture.

From these data, Mr. Shallcross showed how he developed his formula to express the rate of flow in terms of volume coming out of a bin to bring any particle in the cone of flow through the mass. The formula, which is based actually on a computation of the volume of a cone, is

$$Q = \frac{\frac{\pi}{3} h^3 \tan^3 (22\frac{1}{2}^\circ - \frac{1}{2} \theta)}{\cos^3 \left( \frac{90}{45^\circ - \frac{1}{2} \theta} \right) \Phi}$$

$$\text{or } Q = \frac{a h^3}{\cos^3 \theta}$$

The letter  $h$  represents the height of a particle in a bin,  $\phi$  is the angle between the particle and the vertical and  $\theta$  is the angle of internal friction for the particular material.

Mr. Shallcross told of experiments he has made, with models and colored granules, on the actual flow behavior through bins. Actual tests have corroborated his formula.

From a practical standpoint, having determined the angle of friction for a granular material, much could be learned, through the use of such a formula, as to the rate of flow through a bin which would be of benefit as well in determining the desirable rate of feed into a bin from which material is being drawn out. It is believed that the flow of materials through preheaters into rotary lime kilns, for example, might be more uniformly controlled through knowledge of how the material flows through the preheater.

#### Granite Quarrying

"Quarrying Methods of the Barre, Vermont District," a paper presented by W. P. MOULD, Rock of Ages Corp., was mainly concerned with dimension stone quarrying. There are only five quarrying concerns in the district now, he said, as contrasted to 50 half a century ago. Wastage from the block quarrying operations is being processed for chicken grit, aggregates and rip-rap.

#### Talc

The importance of talc to the war industry as the result of increased demands by the electronic industries was emphasized by J. E. EAGLE, W. P. B., in his paper "Block Talc." California block talc has been found to be as good as foreign varieties, he said, in showing actual samples from all over the world. For electronic purposes, high iron content in talc is undesirable, he said. Searches are being conducted for more sources of domestic supply.

#### Beryl

EUGENE H. DAWSON, mining engineer, in his paper, "Beryl, Its Sources and Uses," gave a short description of the methods of recovery for beryllium, pointed out the main domestic and foreign sources of beryl and told of work being done in locating the beryl-bearing permatites of the United States. He also told of work being done on the concentration of beryl by sink and float and flotation methods.

#### Postwar Mineral Control

An entire joint session was devoted to the subject of controlling mineral supplies of the Axis powers through some form of postwar control as a means of preserving peace. The discussion was concerned principally with the desirability of applying sanctions on oil, steel and the light metals. Opinion was divided as to the feasibility of such a plan although the consensus was that force would be necessary to enforce peace, whether or not mineral sanctions are applied.

#### Rock Dust and Explosions

A paper, "Use of Rock Dust to Prevent Dust Explosions in Coal Mines," by H. P. GREENWALD, U. S. Bureau of Mines, summarized developments for the years 1938-1943. The extent of rock dusting in the United States has grown steadily, according to the statistics. In 1941, 10.2 percent of all under-ground coal mines used rock dust, representing 57.1 percent of the total underground production.

There were 57 explosions involving dust reported to the Bureau of Mines in the five year period. In 32 of them no rock dust had been used in the part of the mine traversed by flame, leaving 25 in which rock dust may

have played a part. It was pointed out in the report that twice as many escaped per fatality and injury in the explosions in which rock dust played some part than did in the case of the explosions where no rock dust was present.

## Flotation Theory and Practice

From a symposium on flotation, five papers are available. Two of these were theoretical. One, Technical Publication No. 1702, "Flotation as a Power Process," by E. H. ROSE suggested an analogy between flotation and grinding. The same author had another paper, "The Controversial Art of Flotation," Technical Paper No. 1679, in which he philosophizes about flotation as "a science in so many variables that only art can blend them." In other words the materials to be treated by flotation offer so many variables that there are many inconsistencies in results and experimentation is always necessary.

ARTHUR F. TAGGART, professor of mineral dressing, School of Mines, Columbia University, and NATHANIEL AREITER, Battelle Memorial Institute, had a paper "The Chemistry of Collection of Nonmetallic Minerals by Amine-type Collectors." We are afraid the average reader of ROCK PRODUCTS would not understand much of this paper unless he has devoted much time to the theory of flotation. A paper, Technical Publication No. 1675, "Unusual Reagent Combination Improves Flotation at Climax," by ROBERT E. CUTHBERTSON, metallurgical engineer, Climax Molybdenum Co., described in detail the laboratory development and mill application of an unusual combination of flotation reagents. This paper emphasizes the need for a research laboratory to study and constantly improve any flotation operation.

Another application of flotation, discussed in detail, is contained in Technical Paper No. 1680, "Flotation Machines at the Tennessee Copper Co.," by J. F. MYERS and F. M. LEWIS, superintendent and assistant superintendent, respectively. It is an interesting study of several types of flotation machines for special purposes. Their conclusion is: "The evidence and experience of the authors lead to the opinion that a close coordination of flotation process factors and flotation machine characteristics can be used as a method of the selection of the proper flotation machine for any given problem."

Probably the paper of most interest and value to the rock products industry is one by S. A. FALCONER and B. D. CRAWFORD, American Cyanamid Co., on "Froth Flotation of Some Non-sulphide Minerals of Strategic Importance." It is a summary of the results of experiments and experience with various reagents made by the

American Cyanamid Co. Most of the paper deals with metals, but some, such as concentration of titanium minerals from beach sands may some time be very interesting to some rock products producers. There is also considerable information on flotation of fluorspar, spodumene, kyanite, corundum, strontium salts, gypsum.

## Magnesia and Magnesium

Four papers brought the subject of production of magnesia and magnesium from dolomite as near up-to-date as we presume can be done under war conditions of secrecy.

One of these papers, Technical Publication 1671, "Production of Magnesium by the Carbothermic Process at Permanente," by T. A. DUNGAN, chief process engineer, Permanente Metals Corp., was originally delivered at the Chicago divisional meeting last October. The paper deals wholly with the reduction of magnesium oxide with carbon in electric furnaces. The origin of the magnesium oxide is only casually referred to. It comes from Salinas dolomite, which is calcined at the quarry and the calcined product, dolomitic lime, but termed by metallurgical engineers, calcine, is trucked to the Permanente sea-water magnesia plant on Monterey Bay, where the CaO is removed by leaching with sea water and the precipitated magnesium hydroxide is washed, filtered and dehydrated to form MgO, 96 percent pure. This is the process now quite widely used for making magnesia from salt water and brines.

Another paper, Technical Publication No. 1670, by ANDREW MAYER, chief engineer, National Lead Co., entitled, "Plant for Production of Magnesium by the Ferrosilicon Process," is quite a comprehensive description of the Magnesium Reduction Co. plant at Luckey, Ohio. The Defense Plant Corporation supplied the money and the National Lead Co.'s subsidiary built and operates the plant. The process used is that developed by Dr. L. M. Pidgeon, Canadian Research Council, and is the same as that used by the New England Lime Co. and much the same as that of the Ford Motor Co.

The dolomite is quarried and burned to lime or "calcine" in shaft kilns at the nearby plant of the National Gypsum Co. From the experience gained in the pilot plant the magnesium company engineers drew these conclusions in regard to the quality of dolomite required: It should contain not less than 21 percent  $MgO$  and not more than 2 percent acid-insoluble material; it should contain less than 0.10 percent sodium plus potassium, in order to avoid more or less serious fires, due to spontaneous ignition when the retort is opened.

The metallurgical process is prob-

ably familiar to interested readers because it has been described in ROCK PRODUCTS several times in the last two years. It consists of briquetting mixtures of ground lime and ferrosilicon, which is a reducing agent, and heating the briquettes in closed retorts under a vacuum. The retorts are heated to 2130 deg. F., and in spite of use of the most heat-resisting alloys have a life of only about 250 days, which seems to be the chief handicap to this process.

The paper makes no mention of the byproduct, or waste product, which apparently should be a calcium silicate with iron present either as metal or oxide. It should have some value as a cement raw material unless it still retains too much magnesia, which is possible.

The third paper, Technical Publication No. 1707, "Some Developments in the Production of Magnesium from Dolomite by the Ferrosilicon Process," by W. M. PEIRCE, R. K. WARING, L. D. FEDDEROLF and G. T. MAHLER, all of the research division of the New Jersey Zinc Co., discusses work on the Pidgeon process since January 1942, when the New Jersey Zinc Co. started investigation of it at the request of the W. P. B. One of the improvements to the original process was to make wet briquettes, by slaking the dolomite lime. The briquettes are preheated to get rid of both free water and water of hydration before being put in the retorts. Various devices were tried to prevent hydration of the magnesia because this reduced the density of the briquettes.

This comment may interest lime and portland cement manufacturers: "Preliminary results indicate that the use of 1 percent sodium chloride or calcium chloride at least partially inhibits hydration of the magnesia."

It would appear from this paper that making satisfactory briquettes which can be handled to the furnace, constitutes one of the chief problems. The briquette making properties of dolomitic limes apparently vary considerably. It was found that the addition of from 1 to 5 percent of fluorspar very much increased the density of the briquettes which is a distinct advantage.

The fourth paper was presented by R. R. LOYD, W. T. RAWLES, and R. G. KNICKERBOCKER, U. S. Bureau of Mines, and reported the results of the "Pilot-Plant Production of Magnesia from Sloan Dolomite." The dolomite experimented with came from the quarry of the United States Lime Products Co., Sloan, Nev., which is 19 miles from Las Vegas. The process used is treatment of a suspension of dolomitic lime with magnesium chloride which results in a slurry of  $MgO$  and  $Mg(OH)_2$ , and a solution containing  $CaCl_2$ . The main problem was to obtain a magnesia

(Continued on page 63)



## DISHING IT OUT



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## War Products

(Continued from page 66)

precipitate that can be easily washed, settled and filtered, and free enough from impurities to be used to make magnesium.

In this process the dolomite is relatively hard-burned, not only to calcine all the CaO but to render the  $MgO$  relatively inactive. The calcining was done in shaft kilns. After leaching and hydroclassification, the slurry consists of a suspension of  $MgO$  and  $Mg(OH)_2$  in a solution of calcium and magnesium chlorides. The  $MgO$  and  $Mg(OH)_2$  are separated by continuous counter-current decantation. The slurry is filtered, after going through a thickener, and dried. By regenerating the spent magnesia circuit leach liquor with  $CO_2$  gas,  $MgCl_2$  is recovered with a  $CaCO_3$  precipitate.

The conclusions from 12 months' operation of the pilot plant convinced the investigators that a product containing but 0.5 to 1.7 percent CaO and 0.5 percent other impurities could be made successfully. Another conclusion was that dolomites vary so much that it is necessary to determine the adaptability of a particular deposit to this process.

### New Aluminum Recovery Processes

Two papers, No. 1706 and No. 1713, should prove of interest to lime and portland cement manufacturers. The first of these is "Alumina from Clay by the Lime-sinter Method," by F. R. ARCHIBALD and C. F. JACKSON, consulting chemist, and consulting engineer, project manager, respectively of the Ancor Corporation. The second is "The Kalunite Process," by ARTHUR FLEISCHER, technical director, Kalunite, Inc.

The lime-sinter method closely parallels the portland cement manufacturing process and may some day supply the means for portland cement manufacturers to diversify their output. An D. P. C. plant to use this process is under construction at Harleyville, S. C. Starting with raw clay and limestone ground and mixed together as a slurry, which is filtered and calcined in a rotary kiln, the sintered product is leached, the solution purified and alumina trihydrate recovered from the solution. The hydrate is then calcined to the oxide, which is the starting point in reduction to the metal aluminum.

It so happens that the residue or waste product of the process is mostly dicalcium silicate and calcium carbonate and is a very desirable raw material for the manufacturer of portland cement. In fact 85 percent of this material was used for the raw material mix to make portland cement in the pilot plant. It is said the process can compete with the present ones using bauxite ore. Since American known resources of bauxite are

quite limited, it might be well for cement manufacturers to begin looking into the possibilities of this process.

The kalunite process uses alunite, which is not so common a mineral as clay, although the process, it is said, can be adapted to any aluminum containing ore. A pilot plant is under

construction at Salt Lake City, Utah. It is chiefly a wet chemical process involving leaching with acid solution, decantation, filtering to remove crystals, solution of crystals for autoclaving. It is chiefly interesting to lime and cement manufacturers as a competitive process to the lime-sinter method.

## Gypsum in the War Effort

IN KEEPING WITH CONSERVATION orders limiting consumption of strategic materials needed for the war effort, Federal agencies engaged in necessary war construction are turning to the use of non-critical materials as substitutes for metal and lumber. Unique among materials that are available for the purpose and at the same time adaptable to unusual construction demands is ordinary gypsum.

In Utah, for example, government engineers on one large military project have approved installation of 7,000,000 sq. ft. of laminated gypsum board in roof construction. The material specified is a three-ply lamination fabricated from  $\frac{1}{2}$ -in. gypsum board of ordinary commercial grade. On another large project in upper New York State, Navy engineers have authorized erection of 2,500,000 sq. ft. of roof decks built of poured gypsum.

Roofs constructed of laminated gypsum board are an innovation in the engineering and construction fields. In terms of manufacture, however, this method means only that a new use has been found for an old product already widely known. In this method as well as the more familiar poured-roof construction, the gypsum adequately performs structural functions that are customarily served by metal and lumber elements, one or both. Weather-proofing is applied in the usual way on either type of roof. A gravelled covering on an asphalt base or built-up roofing of felt and asphalt or pitch seals the gypsum surface. Roofs of both types may be built either flat or sloping up to a 45-deg. incline.

Gypsum materials are manufactured in two-ply, three-ply and four-ply laminations of various lengths and widths, generally using  $\frac{1}{2}$ -in. mill stock. However, laminations can be fabricated from stock of any desired thickness. Shiplap is obtainable in the form of two-ply material made from either  $\frac{3}{8}$ -in. or  $\frac{1}{2}$ -in. board. Tongued and grooved flooring board is another recently developed product. It is made in three-ply laminations.

Construction of gypsum slab roofs by the method of pouring-in-place begins with the erection of a form support consisting of ordinary  $\frac{1}{2}$ -in. gypsum board, which may also become the ceiling in the finished interior. The poured gypsum is reinforced with a light wire mesh weighing 0.12 lb. per sq. ft. The poured material is laid  $2\frac{1}{2}$  in. thick.

To provide engineers, architects and contractors with new data respecting the structural qualities of laminated gypsum board and plank, the Building Materials Division of the War Production Board has arranged with the Bureau of Standards for testing of the standard commercial shapes, sizes and grades of laminated gypsum products. Similar investigations have been carried out with satisfactory results in engineering laboratories during the pre-production period while manufacturing methods and techniques were developed.

Tests of the strength factors and fire resistant qualities of the several types of laminated gypsum products and poured gypsum roofing have been conducted by manufacturers, with satisfactory results. The Bureau of Standards is making its own tests, however, for the purpose of specifying the safe load limits, structural properties, and fire resistant qualities.

The Building Materials Branch of WPB, through its Gypsum Roofing and Insulation Products Section, is assembling technical data which will be placed at the disposal of engineers, builders and other persons who may want this detailed information.

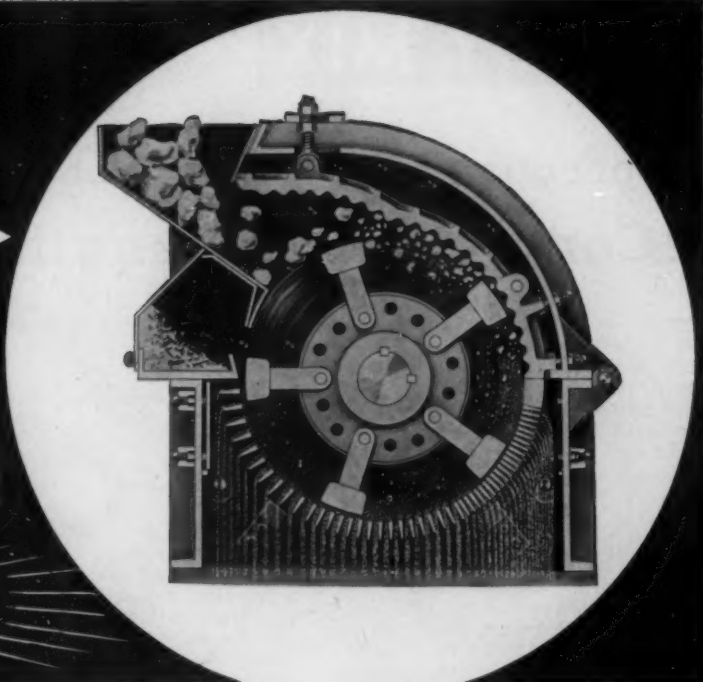
The wide geographical distribution of gypsum deposits and the existence of numerous well located manufacturing establishments make these products desirable as possible substitutes for metal and lumber in war plants, military and naval installations, cantonments, warehouses, industrial construction and especially war housing. The shorter hauls as compared with lumber and steel at most points would to some extent relieve the strain on rail, water and highway carriers, according to studies prepared by technicians in the Building Materials Division.

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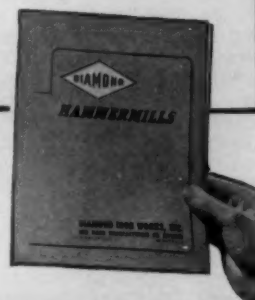
**THE "SELF CLEANING"** feature saves 2 or 3 hours' time if for any reason there is a power stoppage with feed continuing. The grates are mounted on a cam and can quickly be lowered from the outside (without opening cover) and the extra clearance permits centrifugal force to clean the machine in a few minutes.

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## Application of Theory of Probability to Design of Concrete for Strength Specifications

By STANTON WALKER\*

**T**HE THEORY of probability can be applied to furnish a basis for design to produce concrete for which there will be a reasonable assurance that no test, barring an unusual occurrence, will fall below a stated strength.

Suppose, for example, you are required to produce concrete having a minimum strength of, let us say, 3000 p.s.i. While such a specification is unrealistic, because something will almost surely happen to cause a few tests to fall out of line, you can, with the proper background, design for an average strength which will assure you of approximately the percentages of chances that you choose that no specimen will be lower than that specified. A more practical application of the problem comes from the consideration of the new A.S.T.M. Specification for Ready Mixed Concrete, which requires that no test be lower than 80 percent of the strength specified and that the average of any five consecutive tests shall be not less than the specified strength. The penalty of over-design, increases, of course, as the percentage of favorable chances is increased.

In order to implement this discussion I shall have to introduce certain mathematical terms. One of them is a coefficient of variation, generally represented by the symbol  $V$ , which may be considered as a measure of the uniformity in strength tests of concrete produced by a given plant. That measure—that coefficient of variation—must be determined from the history of the past performance of the plant as measured by strength tests. In order to determine it, strength tests of a relatively large number of batches of the same class of concrete must be studied. By the same class I mean concrete for which the variations which occur are inherent in the operation and the testing procedure and not a result of some controlled change in materials or proportions—such as, for example, changing brands of cement.

My studies have not, as yet, been carried far enough to permit me to suggest how few batches may be used to obtain a reasonably dependable value for the coefficient of variation.

\*Abstracted from the paper presented by Mr. Walker, Engineering Director, National Ready Mixed Concrete Association, at the recent convention in New York City.

I am doing some further work on that question. However, it can be said that the larger the number of batches the more dependable the value. Probably tests of about 50 batches should be considered as the minimum; 100 batches would be better and 200 still better.

I have referred to tests of "batches" rather than "specimen." I do not believe that one specimen should ever be depended upon to represent a batch. Two specimens should be considered as a minimum and the requirement for three specimens or more of the new A.S.T.M. specification is much to be preferred.

### Determining Coefficient of Variation

The determination of the coefficient of variation involves the use of only simple arithmetic but, it must be confessed, a fair amount of that. The steps may be described briefly as follows:

(1) Average the strengths of the specimens from a single batch, if there is more than one specimen, and consider this as a single "test." If only single specimens are available from each batch consider that result as a single "test."

(2) Obtain the average for all "tests"—i.e., the average of the 50 or more batches being used to determine the coefficient of variation—the measure of your ability to perform in producing uniform strength concrete.

(3) Determine the differences be-

tween this average and each individual "test," without regard to sign—that is without regard whether it is positive or negative.

(4) Square these differences and obtain the sum of the squares.

(5) Divide the sum of the squares by the number of the batches less one—i.e., divide by  $(n-1)$ .

(6) Get the square root of the result in Step 5. This is the standard deviation of a single test.

(7) Express the value obtained in Step 6 as a percent of the average strength. This is the coefficient of variation of a single test.

It seems to me that the most convenient and understandable way to use the normal probability curve is to consider its integral. The integral of the normal curve can be plotted in such a manner as to be readily understandable and so as to show the percentage of the number of values, from a given random group, which should fall above different stated values. Such a curve is shown in Fig. 1. This curve has been called a "developed probability curve" and also an "ogive" curve.

This particular curve is drawn for values conforming to the normal law and which have a coefficient of variation of 14.5 percent. A different curve would result for different coefficients. Now, observe the points plotted on the same chart. They are from actual data of concrete field tests on 105 batches—each point generally representing the average of two 6- x 12-in. cylinders. The coefficient of variation for these actual field data is 14.5 percent—the value used as the basis for the theoretical curve. These test data were arranged in order of mag-

TABLE 1. COMPARISON OF FIELD DATA WITH NORMAL LAW

Percent of Average Strength	Job A		Job B		Job C		Job D	
	Normal Curve	Actual	Normal Curve	Actual	Normal Curve	Actual	Normal Curve	Actual
150	Negligible	0	Neg.	0	Neg.	0	2	3
120	Negligible	0	7	7	9	8	20	14
110	8	7	23	33	25	27	34	21
100	50	50	50	53	50	52	50	43
90	92	92	77	77	75	71	66	65
80	Neg.	100	93	97	91	92	80	87
50	Neg.	100	Neg.	100	Neg.	100	98	100
No. of Tests	(58)		(30)		(105)		(63)	
Coefficient of Variation	(7.0)		(13.9)		(14.5)		(23.6)	



## Going Places !

The U. S. Navy built thousands of mammoth Landing Boats for invasions all over the world. This L. B. with its gaping doors, measures 375' long, displaces 5,500 tons. Protected by rapid-fire guns. Shallow draft for beaching. Transports, jeeps, trucks, tanks, field pieces, bulldozers, supplies and food.

The top illustration is the artist's conception of the L. B. (beached) showing troops and war equipment disembarking. Other sketches show Gar Wood war equipment: Cargo and troop body, Gun Carriage, Dump Body, Bulldozer, Wrecker Crane, Refueling Tank and Patrol Boat.

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nitude—that is from small to large values—and expressed as percentages of the average. The percentage of number of tests falling above various percentages were then calculated and the points plotted on the chart. Note the extremely close agreement with the theoretical curve.

## Value in Designing Mixes

Table 1 gives further information along these lines and summarizes the results of four projects, comparing the actual field data with the theoretical curve for a few points. I believe that it is self-evident that there is close agreement except for the most variable job—a volume proportioning job-mixed affair of 1923. Now, if we may assume, as the data seem to indicate that we may, that concrete tests distribute themselves approximately in accordance with the normal curve, it is evident that we have a tool which may be very useful in design—if we have a measure of the ability of different plants to perform.

I hope to extend my studies to the point where I can make a fairly supportable estimate of the coefficient of variation applicable to different classes of operators. This is something in which I shall need your co-operation. The least I shall ask of you is that you furnish me some data; I shall urge you to go further and furnish the data and the calculations. At the moment I am not in a position to suggest typical coefficients with assurance. However, in the light of such information as I have, and to illustrate the problem I might venture the guesses given in Table 2.

TABLE 2.  
"GUESSES" OF COEFFICIENTS OF VARIATION FOR DIFFERENT OPERATIONS

Coefficient of Variation*	Kind of Operation
5%	Probably attainable only in well-controlled laboratory tests
10%	Excellent, approaches laboratory precision
12%	Excellent
15%	Good
18%	Fair
20%	Fair minus
25%	Bad

R. W. Crum and H. W. Leavitt, in the 1943 A. S. T. M. "Report on Significance of Tests of Concrete and Concrete Aggregates" give the following coefficients for 100 laboratory tests made about 25 years ago: 1-7 mix, 12.88; 1-5 mix, 10.74; 1-4 mix, 8.57, and 1-3 mix, 7.75.

Based on these coefficients—and remember that I don't have too much confidence in their typicalness—we may arrive at estimates of the average strength which must be attained to have a chosen number of chances that no single test will fall below the

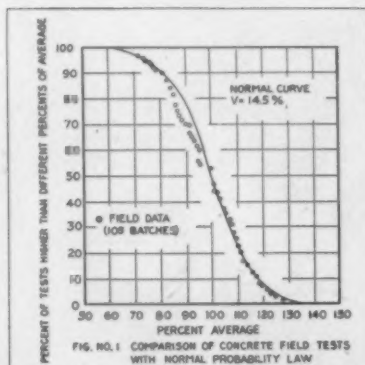


Fig. 1: Graph showing comparison of concrete field tests with normal probability law

specified value or the various indicated percentages of the specified value. Such estimates are given in Table 3 for 9 chances in 10 ( $p = 0.90$ ) and 99 chances in 100 ( $p = 0.99$ ).

Table 3 deserves careful scrutiny. It demonstrates forcibly that investment in good control is self-liquidating. Consider the case of the operator who wishes to have 99 chances out of 100 that no test will fall below 3000 p.s.i. If his operations have a coefficient of variation of 15 percent, concrete having an average strength of about 4600 p.s.i. must be produced. On the other hand, if control is good enough that the coefficient of variation is 10 percent his average may be 3900 p.s.i.; representing a saving of about  $\frac{3}{4}$  bag of cement per cubic yard of concrete. Further, if one is satisfied with 9 chances out of 10 of not falling below the specified strength and 99 chances in 100 of not

falling below 80 percent of the specified strength, an average strength of about 3700 p.s.i. will serve for the operator with a coefficient of variation of 15 percent. Note that the operator with a coefficient as bad as 25 percent just can't feasibly meet a rigid strength specification. To have 99 chances in 100 of having no test fall below 3000 p.s.i. he would have to produce concrete averaging about 7200 p.s.i.

Table 4 presents this same picture in another way. It gives the chances in 100 of falling below the average strength. For example if an operator has a coefficient of variation of 15 percent and is producing concrete for which the tests show an average strength of 4000 p.s.i. it may be anticipated that: (1) 50 of 100 tests will fall below 4000 p.s.i.; (2) 25.2 of 100 tests will fall below 3600 p.s.i.; (3) 9.2 of 100 tests will fall below 3200 p.s.i.; (4) 2.3 of 100 tests will fall below 2800 p.s.i.; and (5) 0.4 of 100 tests will fall below 2400 p.s.i.

In the preceding discussion I have tried to be careful to refer to the uniformity of the test results rather than the uniformity of the concrete. It is evident that the determined coefficient of variation is a combination of variations inherent in each of the several steps involved in obtaining the test results. To illustrate what I mean let us divide the operation into two steps (and there are many more than two) as follows: Step 1: The proportioning and mixing the concrete, and step 2: The sampling, curing and testing of the specimens.

It is evident that there are variations inherent in Step 2 which are entirely independent of the varia-

(Continued on page 74)

TABLE 3. AVERAGE STRENGTH REQUIRED FOR DIFFERENT CONDITIONS

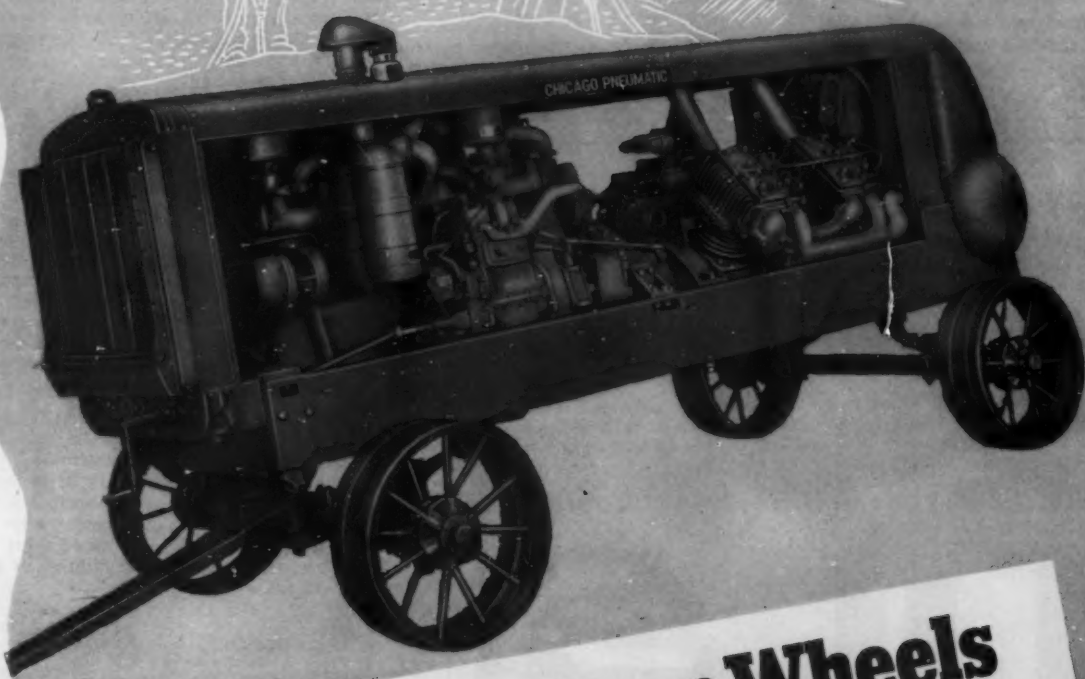
Coefficient of Variation of Operation	Average Strength for Various Strengths to be Met (All Strengths Expressed as Percent of Specified Strength)							
	—9 chances in 10—				—99 chances in 100—			
	100	90	80	70	100	90	80	70
5	104	..	..	..	113	102	..	..
10	115	104	..	..	130	117	104	..
12	118	106	..	..	139	125	111	..
15	124	112	100	..	154	138	123	108
18	130	117	104	..	172	155	138	120
20	134	120	107	..	187	168	150	131
25	147	132	118	103	239	215	191	167

TABLE 4. CHANCES OF FALLING BELOW INDICATED STRENGTH

Percent of Average Strength	Chances in 100 of falling below for different coefficients of Variation						
	5	10	12	15	18	20	25
100	50.0	50.0	50.0	50.0	50.0	50.0	50.0
90	2.3	15.9	20.4	25.2	29.2	30.9	34.5
80	Neg.	2.3	4.8	9.2	13.4	15.9	21.2
70	....	0.2	0.7	2.3	4.8	6.7	11.5
60	....	Neg.	Neg.	0.4	1.3	2.3	5.5
50	....	....	....	Neg.	0.3	0.6	2.3



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## Maintenance

(Continued from page 63)

servation of one good man who will find some occasion for further training as belt and idlers get worked in.

7. When first running a load over belt watch all critical points closely as in No. 2.

8. If loaded belt shows need of further training remember: It is most likely because load is not properly centered or (at loading point) tends to thrust belt sideways. Inspect carefully for this and correct it in preference to shifting any RETURN ROLLS.

9. Self Training Return Rolls correct for irregularities in the conveyor system and the belt itself. Space evenly amongst return rolls. Self Training Troughing Rolls correct for irregularities in load and (somewhat) for poor troughing of belt itself. Space first Self Training Troughing Roll just after loading skirts are clear and then fairly uniform along top strand. All self training rolls must be raised slightly above level of adjacent rolls.

10. Don't ever attempt to train a belt by shifting any pulleys from a square and level position.

## Ready-Mixed Concrete

(Continued from page 72)

tions inherent in Step 1. Consequently it is clear that the actual uniformity of the concrete is better than the uniformity of the test results, if, in fact, the samples are taken from random, and not from selected, batches.

Some idea of the variations inherent in the testing procedure can be obtained by experiment. Suppose that a single batch of concrete is mixed with unusual care to be assured that the batch is as nearly homogenous as it is humanly possible to make it. If a relatively large number of specimens are taken from that batch and tested the results will give a good idea of the variations inherent in Step 2.

For example let it be assumed that this coefficient of variation is 5 percent; also assume that the overall coefficient of variation is 15 percent. Then an order of magnitude estimate can be made as to the coefficient of variation inherent in Step 1 as follows:

$$V \text{ Step 1} = \sqrt{(15)^2 - (5)^2} = 14.2\%$$

In closing this discussion it should be emphasized that the estimates outlined are, in fact, estimates. They are based on the theory of probability—on what may probably happen. Their accuracy increases with the number of tests involved and decreases rapidly as the number of tests decrease.

## Repairing Chutes

CHUTES may be repaired when necessary by welding or patching in place. When it is necessary to completely replace a chute it should be studied to determine any faults or weak points it may have so they may be corrected rather than to simply order a new one from the original drawings. The trend in modern chute work is toward lighter plates, more removable wearing plates, and all-welded construction which gives a neater, lighter, and more economical design, without sacrifice of strength or life of the chute.

In addition to the belt and chutes, the mechanical features of conveyors require prompt repair or replacement after failure. The most common replacement is in bearings of pulleys and idlers. Worn or broken idler pulleys cause excessive wear of belt covers and sharp or jagged edges may cut through both the cover and the fabric.

## Open Quarry

A. E. GALLION is the present owner of an old quarry property in Madison township near Trenton, Mo., which has not operated for several months.

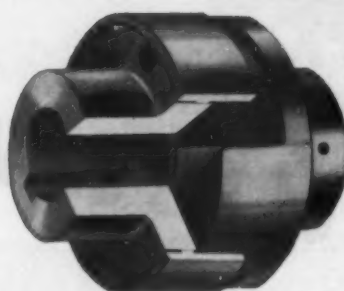
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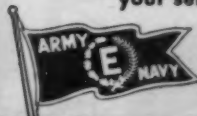
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# HEAVY-DUTY CONSTRUCTION EQUIPMENT



## Post-War Prospects

(Continued from page 55)

them with the necessity of their responsibility. Today, he said, half the population of the United States is involved directly or indirectly in the war effort. However, when the war ends we shall have five to eight million more people to provide employment for than in 1940, counting on youngsters returning to schools and wives returning to their household duties. Consequently, we must have something on the books besides talk. There must be plans, specifications and provision for financing

projects. He recommended everyone get behind the A.R.B.A. program.

About 100 million dollars' worth of construction equipment belonging to the government will be, or is now, lying about the country, which Mr. Skelly was afraid would be retained by the government because certain individuals in the present administration had in mind turning it over to some kind of a W.P.A. organization for force account construction.

C. H. SELLS, superintendent of public works, New York State, described in forceful fashion the splendid work being done by an official committee on post-war planning,

appointed by Governor Dewey. He thought private industry would go through the post-war period of readjustment fairly rapidly, but there would be some lag in public works, because local communities have been rather slow in developing plans for betterment of their facilities, such as water-treatment plants, sewers, sewage treatment, etc., of which there are staggering deficiencies.

These conditions were early recognized in New York State, Mr. Sells said, and official post-war planning was begun in 1942, to coordinate and stimulate all kinds of public work. The committee was provided with ample funds for preparation of plans, specifications, etc. It is in constant touch with the situation to check progress. It has also served a very useful end in coordinating the work of the various state departments.

One of the outstanding problems that has to be faced was shortage of technical men and engineers. Consequently, the committee was authorized to employ outside engineering talent and consulting engineers. All projects and plans, however, have to be approved by the superintendent of public works.

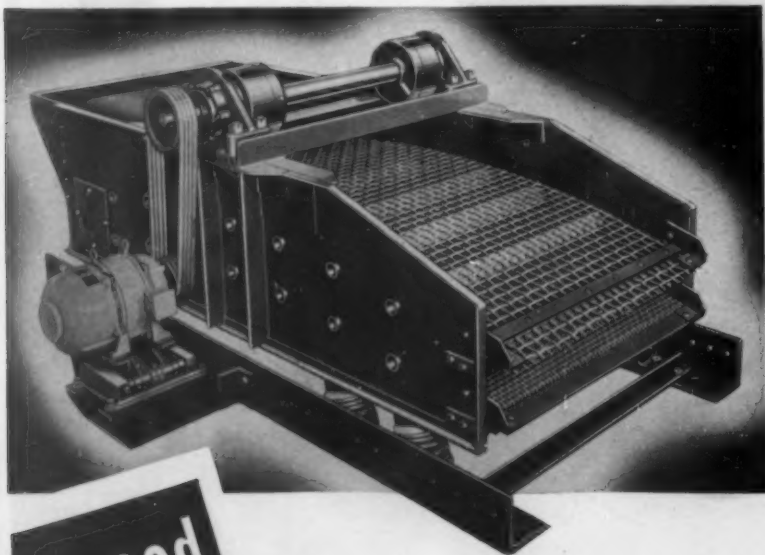
In the case of municipal projects, all are entitled to consult the committee for engineering services. Applications are also referred to the state comptroller to pass on their soundness. The availability of post-war labor is checked by the state labor department. If the project passes the scrutiny, the state will share equally with the municipality, the cost of preparing plans and specifications up to 4 percent of the estimated cost of the project. The cost of the project itself is borne by the community.

Mr. Sells said that projects received up to January 1, 1944, exceeded 3500 in number and 300 million dollars in estimated cost. These local projects included sewers, sanitation, water supply, park improvements, schools, public buildings, bridges, etc. Of these, he said 1049 had already been approved by the superintendent of public works and the state post-war planning committee; some 1700 more were being investigated. A time limit is placed on the preparation of plans and specifications. Mr. Sells said that the system described meets with favor and there has been no slackening in interest. Every locality is free to select any kind of a worthy project.

Plans and specifications can be prepared even where as yet there is no budget authority for the funds for the project of some state division, if the project is considered essential. No difficulty is anticipated in getting an appropriation from the legislature under these conditions.

The New York State highway program, Mr. Sells said, would continue on a greater scale than ever. It is

(Continued on page 78)



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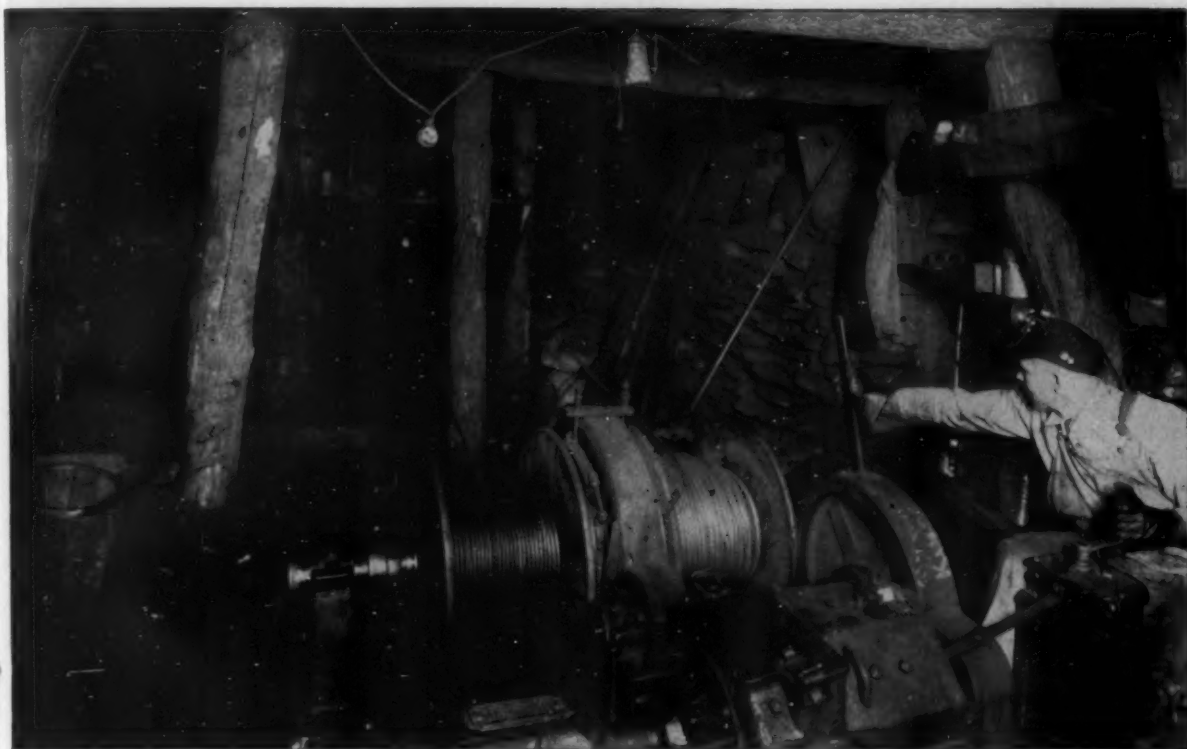
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Wire Rope especially must be given every possible care in order to last just as long as it possibly will. The chance of replacing wire rope is apt to continue limited. Great quantities of it still must be produced for our armed forces. As our offensive power gains momentum and invasions increase in number and scope, the greater becomes the tonnage of war materiel which must be hoisted, handled, loaded and unloaded all around the globe.

In the white heat of battle when lives depend upon it, wire rope must take abuse necessitating replacement long before its time. So it is that the important matter of conserving wire rope falls heavily on the throttle hand of users on the home front. To help you save wear and tear on your wire rope and keep it working, Union Wire Rope engineers have prepared and offer five different booklets entitled: 1. *Correct Handling of Wire Rope*. 2. *Lubrication of Wire Rope*. 3. *Splicing Wire Rope*. 4. *Socketing Wire Rope*. These give you specialized

information. 5. *Rope Dope* amplifies on abuses of wire rope and the remedies. All are written in non-technical terms. Put into practice, the information contained in these booklets will help you contribute to the war effort now by conserving wire rope and it should stand you in good stead in safer and more satisfactory wire rope operation post-war. All are FREE for the asking. A penny post card request will bring any or all of the booklets.



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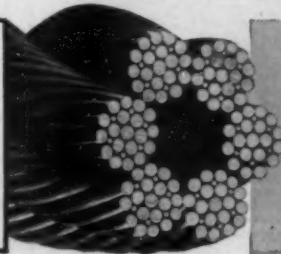
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## Post-War Prospects

(Continued from page 76)

already authorized by law. However, it has been coordinated with post-war planning as a whole. The highway program is broader in scope than a mere post-war project; it is intended to cover a 5-year period and an expenditure of 700 million dollars. Funds for two years are already available; financing for the other three years remains to be done.

The highway plans include a cross-state express highway, probably the biggest state highway project ever conceived by any state. It will be designed for 70-mile speeds and be something like 450 miles long. It will be financed by the state with such federal-aid money as may be

made available. The state highway program as a whole, Mr. Sells said, will be about \$140,000,000 in the first post-war year.

The projected public housing program in New York City, which Mr. Sells referred to briefly, is expected to cost \$300,000,000, two-thirds of which the city will finance. Other projects in New York City (all of them not included in the state totals given above), in which the state will share, amount to \$125,000,000. Altogether about 500 projects to cost \$700,000,000 are planned by the City of New York on its own account.

Arterial highways through cities will be built on a 50-50 cost basis between city and state. Several state authorities are planning projects on a self-liquidating basis. The funds

advanced by the state must be repaid out of earnings.

In addition to the kind of construction projects enumerated, Mr. Sells said the United States Army Engineers have a program for spending about \$5,000,000 in the state on flood prevention.

## Debate on Federal Aid Highways

Under the title "Panel Discussion on Proposed Federal Aid Legislation for Highways," quite a lively debate developed between H. A. MacDonald, first vice-president, American Association of State Highway Officials, commissioner, Department of Public Works, Massachusetts, and Wm. J. Cox, president, Northwestern Association of State Highway Officials, commissioner, State Highway Department, Connecticut. The Northeastern Association is a part of the American Association, so the debate was an exposé of the rift in that Association over the apportionment of federal aid money.

Mr. MacDonald took the point of view that the federal aid state highway systems are badly deteriorated and a sound policy of rebuilding them to modern standards is what the occasion calls for. Highway construction or reconstruction comes first and the employment second. The national legislation proposed by the A.A.S.H.O. would call for one billion dollars a year for three years of federal aid, to be matched dollar for dollar by the states. The method of proportioning the federal aid to the states would be the present formula, 50 percent for population, 25 percent for road mileage and 25 percent for area, unless changed by a new act of Congress.

Mr. MacDonald admitted that this formula was unfair to the industrial states, that he personally favored a 60-40, or 66 2/3-33 1/3 or 75-25 percent division, with the emphasis on population, as would probably be favored by the A.A.S.H.O. as a whole, but he did not think this was the time to open up the question. He did not want to see log-rolling politics enter; he did not want to risk the success of the whole idea by making it a new political issue. Consequently, he thought that the Eastern States should not start a controversy, even though they believed they were not getting a fair break.

Mr. Cox, on the other hand, presented the case of the Eastern (and Pacific Coast) "rebels," who wanted a new formula that would in some fair measure return to the states approximately their own contributions of gasoline tax, or their equitable proportion of the whole federal taxes. This revision of the distribution formula would give to industrial states like Massachusetts and Connecticut a far larger proportion of federal aid money, and these were the states which would have maximum post-war unemployment.

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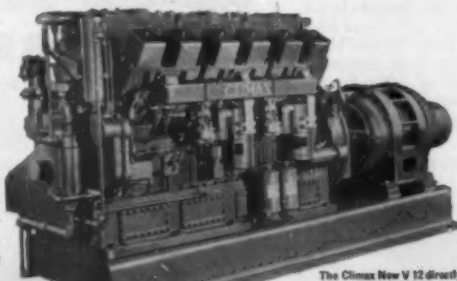
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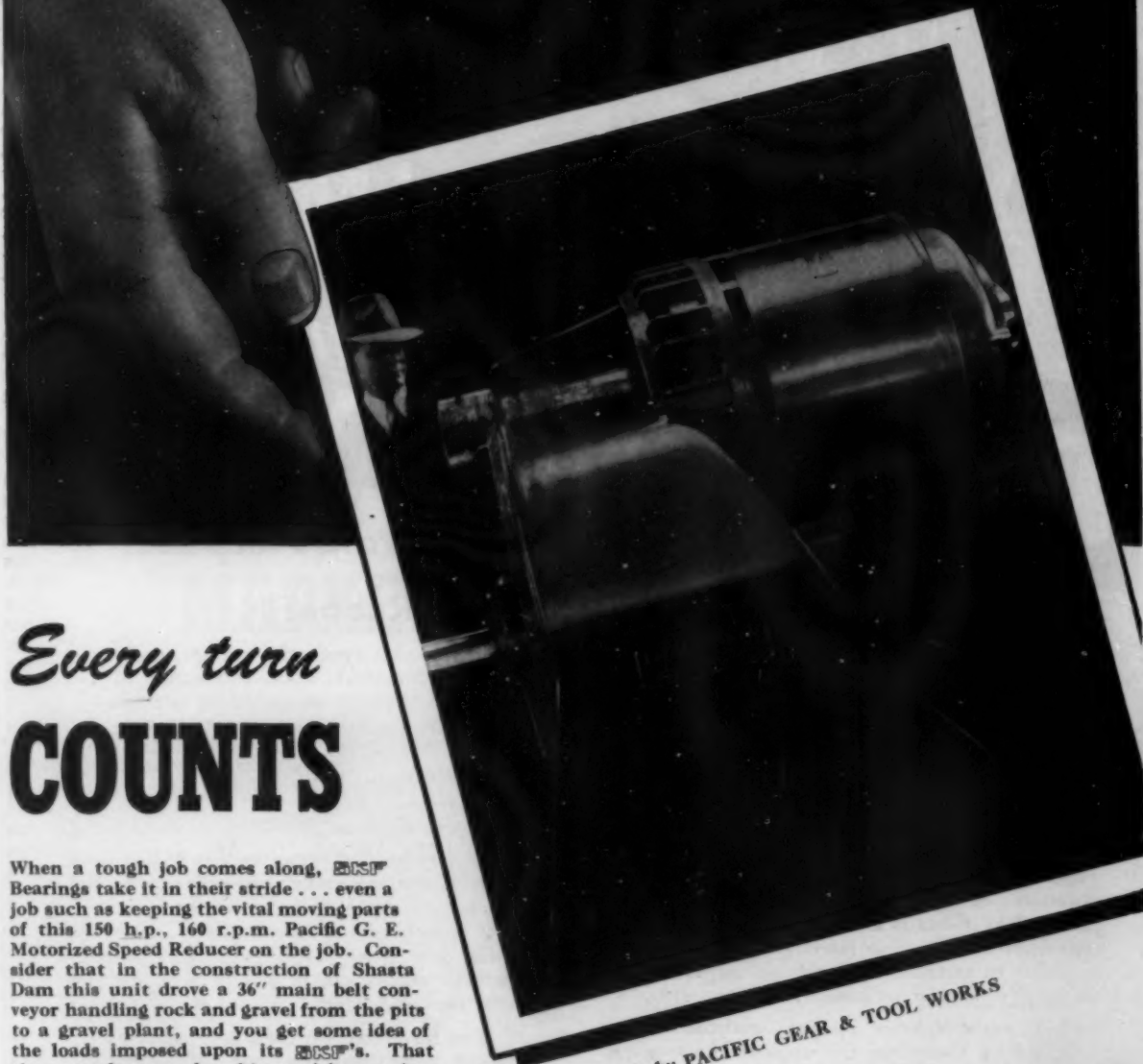
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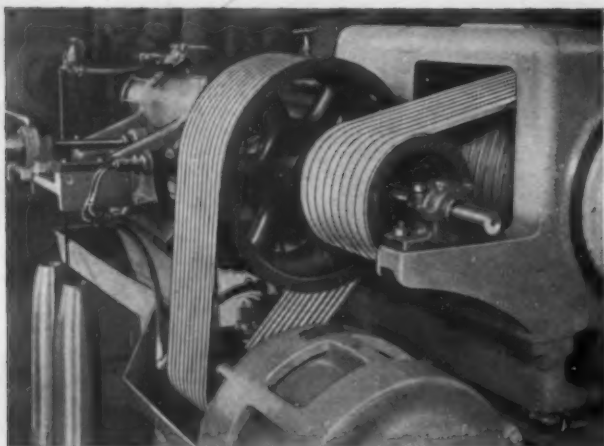
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**MARCH  
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**CONVENTION  
STRESSES FARM  
MARKET**



● CONVENTION reports of the National concrete Masonry Association, the American Concrete Pipe Association, Cast Stone Institute, and Sand-Lime Brick Association will be found in this issue



# CONVENTION

## Planning for Large Post-War Market



Fred W. Reinhold, Anchor Concrete Products Co., Buffalo, N. Y., and new president of N.C.M.A.

**A**BOUT 600 manufacturers of concrete masonry, representative of the industry on a national scale geographically, came to Chicago's Sherman Hotel to attend the annual convention of the National Concrete Masonry Association, February 15-17. The program featured postwar construction prospects outlined by eminent speakers; discussions of legislation affecting the industry by officials of W.P.B., O.P.A., O.D.T., and W.M.C.; the farm construction market; and open forum meetings on production problems and operating methods.

The farm construction market was given special consideration in several of the sessions, as a market that is now available and one that could well keep the industry operating at a high level of production by an aggressive program of promotion and merchandising.

The general sessions were preceded by a business session and the election of officers. Fred W. Reinhold, Anchor Concrete Products Co., Buffalo, N. Y., was elected president. Other officers are: Deane R. Lynde, Cinder Concrete Products, Inc., Denver, Colo., first vice-president; Harold L. Spaight, Cedar Rapids Block Co., Cedar Rapids, Iowa, second vice-president; Raymond A. Berger, Martin Berger Cement Block Co., Detroit, Mich., third vice-president; Clarence E. Ehle, Cleveland Builders Supply Co., Cleveland, Ohio, secretary-treasurer; and E. W. Dienhart, Chicago, Ill., executive secretary.

WALTER J. MANHARDT, Best Block Co., Milwaukee, Wis., retiring president, was elected Chairman of the Board. Directors are: Claude Chand-

**National Concrete Masonry Association holds three-day conference of producers to discuss problems of operation under war-time restrictions and to lay plans for post-war business**

ler, Chandler Materials Co., Tulsa, Okla.; John S. Bailey, Concrete Manufacturing Co., Atlanta, Ga.; H. A. Davis, Washington Concrete Products Corp., Arlington, Va.; S. Paturzo, V. Paturzo Bro. and Son, Inc., Baltimore, Md.; Henry Muller, Jr., Forest Hills Concrete Block Co., Forest Hills, L. I., New York; Edwin P. Weese, Carbon Concrete Brick Co., Youngstown, Ohio; and Jack Freedman, Massachusetts Cement Block Co., Medford, Mass.

Ex-Officio members of the Board of Directors are Benjamin Wilk, Standard Building Products Co., Detroit, Mich.; George H. Krier, Nailable Cinder Block Co., Brooklyn, N. Y.; Harve E. Kilmer, Iowa Concrete Block and Material Co., Des Moines, Iowa; Roy C. McCandless, Cinder Block, Inc., Detroit, Mich.; John S. Chase, Chase Building Products, Inc., Fort Worth, Texas; and John L. Strandberg, Concrete Building Units Co., Kansas City, Mo. Fred W. Reinhold, Deane R. Lynde, Harold Spaight, Raymond Berger and Clarence Ehle comprise the executive committee.

Louis Weatherbee and Francis J. Straub were elected honorary members to the Board of Directors, Mr. Weatherbee in recognition of his past services as an officer and director and Mr. Straub for his contribution to the

industry as the inventor of the cinder concrete block.

The first general session was a joint meeting with the Cast Stone Institute, to consider construction prospects for 1944, postwar possibilities and proposed codes to standardize the dimensions and sizes of building units.

### W.P.B. Emphasizes Farm Market

CARL F. CLAUSEN, chief, Non-Metallic Minerals Section, Building Materials Division, War Production Board, in an outline of construction prospects for 1944, commended the industry for its valuable contribution to the war in making available a non-critical, high quality building material when a good substitute for lumber was needed. He estimated that, through the use of concrete masonry, approximately half a billion board feet of lumber and manufactured boards had been saved, theoretically, in 1943. The use of concrete masonry would have been desirable in its own right, he said, regardless of the savings effected in other building materials. The industry produced approximately 300,000,000 units (8 x 8 x 16 equivalent) in 1943, he said, which would have been sufficient to take care of 100,000 average size houses not over \$6000 in value, as-



A group of interested delegates examines wall charts on the rostrum after one of the National Concrete Masonry convention meetings

suming that approximately 50 percent of the quantity was used for outside walls and foundations in housing.

Mr. Clausen, in commenting on the general cessation of construction, said that the immediate outlook for the concrete masonry industry is relatively favorable, particularly because of much needed farm construction, and the suitability of masonry for maintenance and repair and for housing. On the West Coast, he said, there are still housing programs to be completed.

In his comments on government construction, he said there is a growing tendency among government agencies to scrap the idea of building temporary structures in favor of more permanent ones, of masonry, since there is little to be gained in terms of cost. An investigation is now being made into the availability of bricklayers, he said, which indicates that they can be secured on short notice in critical housing areas. He urged that the concrete masonry industry be ready and equipped, in the event a large housing program materializes and he indicated that his office will cooperate in efforts to expand plant capacities in critical housing areas if concrete masonry is found to be the solution.

The educational program being conducted among farmers by the War Foods Administration to conserve lumber in their maintenance and repair building will go a long way to encourage the use of concrete masonry on the farms, he said. Also, he mentioned that the efforts of the National Concrete Masonry Association and the Portland Cement Association in the same direction are an important contribution to the war effort.

Every farm is entitled to reasonable facilities, he said, and non-metallic minerals are available generally to farmers. Restrictions on dollar volume of permitted construc-



Left to right: F. M. Kettering, C. E. Swanson, and I. J. Westerveld

tion for individuals, farmers, and private industry, under the provisions of L-41, were mentioned briefly. It was pointed out that no permission

### CONSTRUCTION, PORTLAND CEMENT AND CONCRETE MASONRY 1941-1944

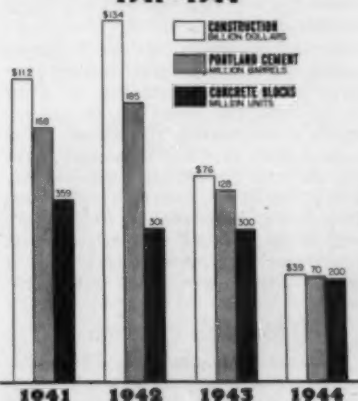


Chart showing the dollar volume of construction compared with cement production and concrete masonry production

is required, unless priority assistance is needed, for building not to exceed \$200, \$1000 and \$5000 for these three classes of prospective customers and that emergency construction, as well as maintenance and repair, may be started without securing authority from W.P.B.

A general relaxation of restrictions including L-41 is not likely soon, he said. If all restrictions on construction and machinery were relaxed he predicted that a steel shortage would materialize in less than two weeks.

Construction figures, portland cement shipments and sales of concrete masonry units were given for 1941, 1942 and 1943, with estimates for 1944, which showed that the concrete masonry industry will fare better than the average in the coming year. Construction reached a high of \$13,400,000,000 in 1942, dropped to \$7,600,000,000 in 1943 and is ex-

pected to fall to \$3,900,000,000 in 1944, he said. Portland cement shipments dropped from approximately 185,000,000 bbl. in 1942 to 128,000,000 bbl. in 1943 and will fall to an estimated 70,000,000 bbl. in 1944. The concrete masonry industry will have a volume of approximately 200,000,000 units (8- x 8- x 16-in. equivalent) in 1944, he estimated, which would be a decrease of only one-third under 1943, comparing with decreases of 49 percent in overall construction and 46 percent in shipments of portland cement figures. [At a later meeting, W. G. Kaiser, Portland Cement Association, remarked that Mr. Clausen probably did not give consideration to the farm building market under development, in arriving at his figures.]

The market for concrete masonry will be spotty in 1944, he said, depending upon the location of housing projects. In the Northeastern part of the United States, the drop in the market for masonry units was estimated at 24 percent, for 1944 as compared to 1943; Southern States, 40 percent; Midwest, 56 percent; and Western, 19 percent.

In concluding, Mr. Clausen predicted that the industry will carry on satisfactorily in 1944 since the materials it uses are readily available and non-critical and because the industry, being made up of widely scattered relatively small plants, is very flexible.

### Post-War Construction

RUSSELL G. CREVISTON, General Chairman, Postwar Committee, Producers' Council, Chicago, outlined the platform for postwar construction as set up by Producers' Council and the means by which it may be put into action. Mr. Creviston's talk was concerned with the broad picture and plans outlined as the result of two years' work by top-ranking executives, which are available in printed form.

One of the planks in the platform is the resumption of civilian con-



"Spec" Collins couldn't resist dropping in at convention to have a chat with G. F. Steigerwalt, Haydite Concrete Products Co., now of California but formerly with the P.C.A. in Chicago



Bernard Vander Heyden, Milwaukee, Wis., right, pointing out some details of his new concrete "plank" unit

struction after the war and recognition by the construction industry that it is responsible for using up the surpluses of materials as they become available. Producers' Council is establishing three centers for the study of building products. Mr. Creviston mentioned that in the past many codes have been harmful to the construction industry, by reason of being excessively severe, and one of the aims of Producers' Council is to correct the situation. Far too heavy floors are often required, he said, in giving an example.

W. D. M. ALLAN, Director of Promotion, Portland Cement Association, in his talk, "What the Concrete Masonry Unit Manufacturer Can Do to Insure Adequate Recognition in Post-war Planning for his Community," presented a strong appeal for adequate planning of private and community construction in addition to larger public works.

He believes that construction will start up after the end of the war in Europe and before Japan is defeated, and emphasized that the industry must plan for it *now*. It will take engineers a year to design plans for projects amounting to \$1,000,000 worth of work, he said.

Too much emphasis is being placed on public works programs and federal projects as a means of providing employment in Mr. Allan's opinion. He pointed out that a public works program of impossible proportions would be required to provide the necessary sources of employment. What he was getting at was that the planning of local projects is being neglected and that is where most employment can be provided.

To emphasize his point, he took a small town of 6607 people as an example, where there would be a shortage of jobs for 500 people after the war. By selecting from a list of proj-

ects planned for that town, it would require a program costing \$1,095,000 to provide 1,144,000 man-hours and it would require 16 engineers a year to prepare for the projects.

Mr. Allan urged that the industry direct its sales efforts toward the farm construction market in 1944. In his opinion, there is an opportunity of developing the largest farm construction program in history, with the current restrictions imposed by Limitation Order L-41. He mentioned that 20,000 hog feeding floors were built in four States in 1943 and that a producer in a metropolitan area of 200,000 population had 326 farm orders.

### Modular Planning

FREDERICK HEATH, JR., Chairman, Producers' Council Subcommittee on Modular Products, Toledo, Ohio, and M. W. Adams, Secretary, Modular Service Association, Boston, Mass., spoke on "Modular Planning—Its Relation to the Concrete Masonry Unit Industry."

The program for dimensional coordination of building materials has been established under American Standards Association Procedure, under the joint sponsorship of the American Institute of Architects and Producers' Council and studies are underway. Mr. Heath said that the project was designed for the purpose of effecting economies in building through the elimination of waste materials through the dimensional coordination of materials. Standard sizes are to be specified to minimize cutting and fitting on the job, that will simplify design and speed construction. Mr. Heath said that modular products would reduce inventories and bring about savings in labor and in materials, but will not standardize building designs. They would narrow down slight differences in dimensions

that now exist, which result in wasteful practices through cutting for piers, flues, coal chutes, etc.

The proposed unit sizes would compensate for joint thicknesses. For clay brick, as an example, three courses would measure exactly 8 in. in height. In concluding, Mr. Heath said that at the present time work is underway with wood and steel interests to standardize window and door opening sizes.

Mr. Adams covered the same subject briefly, before a meeting of the Cast Stone Institute and, in this joint session, followed Mr. Heath's talk with a technical discussion of the use of modular products. He illustrated his talk with slides showing the architectural treatment with the proposed modular products.

He said that Germany has coordinated building unit sizes since 1922, through committees of manufacturers and architects, and that its war industry plants were built according to those standardized units. In Germany, the standard is based on the cubic meter and fractions thereof. A saving of over 50 percent of the time required in construction has been effected as experience was gained in the use of standardized materials, he said. The concrete masonry industry is fortunate, as he expressed it, in that very slight changes will be necessary.

### "Food Fights for Victory"

W. G. KAISER, Manager, Cement Products Bureau, Portland Cement Association, was the principal speaker at a general luncheon and in his subject, "Food Fights for Victory," Mr. Kaiser brought out that there is a tremendous market for concrete masonry units *now*, in farm building.

He emphasized that the large manufacturers in metropolitan areas



Francis J. Straub, honored at convention by election as honorary member of the Board in recognition of his efforts in developing cinder block



as well as the rural manufacturers of masonry units have a market on the farms that must not be overlooked. He mentioned there are thriving farms within a 50-mile radius of most any metropolitan areas, where the farmers have the money and will spend it for repair and maintenance of their buildings. "Let these farmers know you have concrete masonry units," said Mr. Kaiser, "and they will come and get them."

The farmers have always depended upon lumber, he said, and there is normally a market for 10,000,000,000 board feet of lumber. By assuming that a concrete block will take the place of two to two and one-half board feet of lumber, there actually is a potential market for 4,000,000,000 masonry units, said Mr. Kaiser, which is eight times the all-time production rate for a year.

The War Foods Administration considers farm structures as war equipment, and this fact will help materially in getting W.F.B. approval for necessary construction to exceed the \$1000 limit on many farms, in Mr. Kaiser's opinion. He mentioned the farm broadsides printed by the Portland Cement Association and said that the Hamden Building Tile Co., Hamden, Conn., had ordered 15,000 copies for direct mail to farmers. Mr. Kaiser concluded with the presentation of a new colored motion picture illustrating the part played by concrete masonry units in the War Foods Administration program.

#### O.D.T. Regulations

HARRY L. GORMELY, Office of Defense Transportation, discussed the rubber situation in general and the curtailed allocation of tires for 1944. The tire shortage is getting more serious, he said, and will be the number one problem in transportation during 1944.

There are many abuses of rubber tires going on, he said, and much can be done yet to conserve their life. Surveys have shown that many trucks are being overloaded and he urged that these practices be stopped.

In regard to gasoline, he said there will be a greater shortage particularly in the West. A great deal of gasoline is wasted through excessive idling of truck engines and he urged that drivers be educated in that regard.

As to the truck parts situation, he said that more parts are being made available but that the demand is increasing also. In cases where certain parts are hard to get, he suggested that a search be made through dealers, who often can locate a badly needed part. The short courses given for mechanics by O.D.T. were discussed briefly, with emphasis on the training in cold-welding of motor blocks and the metallizing of parts.

In conclusion, he said that private



Philip Paoletta, left, and his father, Ciro Paoletta, Hamden Building Tile Co., Hamden, Conn.

carriers have reduced mileages to 25 percent less than in 1941, and he mentioned one company operating 600 trucks that had reduced its mileage by 5,000,000 miles in one year by practicing conservation measures.

W. L. FULLER, Eastern Manager, National Concrete Masonry Association, Washington, D. C., briefly gave his own background and outlined how the membership could best take advantage of Washington representation.

#### Plant Layout and Production Methods

Operating problems were the subject of an entire session presided over by John L. Strandberg, Chairman of the Board. The postwar plant was given consideration in this meeting, which was productive of many ideas based on past experiences.

The first part of the program was handled by the Detroit Concrete Products Association with Benjamin Wilk, Standard Building Products Co., presiding over a symposium on plant layout and production methods for increased efficiency.

The Detroit Concrete Products Association has been making an intensive study of plant layout design and has been in consultation with machinery manufacturers and other competent authorities. To bring the results of its findings before the meeting, the symposium was divided into sections on cement and aggregates, machine room, curing, handling, yarding, etc.

ROY McCANDLESS, Cinder Block, Inc., Ray Berger, Martin Berger Cement Block Co. and David Warsaw, Hay-Con Tile Co., with Mr. Wilk, comprised the "Board of Experts" for the symposium.

In his introduction to the program, Mr. Wilk said that control of quality of product was the uppermost consideration. A modern plant should, he said, be able to produce masonry units to any specification with uniformity. A plant with one modern machine, having a capacity of 4000

to 5000 masonry units daily in a single shift, was selected for discussion, said Mr. Wilk, because it was believed that the trend was toward the larger capacity machines even if such machines might be operated only part time.

Roy McCandless was then introduced, to discuss the complete plant from the time the aggregate comes in until the units are delivered. In reviewing recent conditions which necessitated over-production in many plants, Mr. McCandless said that over-crowded plant facilities have led to higher unit production costs. One of the first things to consider is the specifications to be met, including the specifications desired by the manufacturers with respect to the quality and characteristics of the units to be manufactured. There should be facilities to control moisture, etc., and costs must be regulated. In Mr. McCandless' opinion all plants spend or waste enough money in both labor and materials to build a complete automatic plant. He predicted that the time will come when college-trained men will be needed to run concrete masonry unit plants.

The first step in building the plant



Roy C. McCandless, Detroit, didn't know the camera man was around to catch him in conversation with Miss Jahnske, secretary to E. W. Dienhart

is to determine how it should be fed materials to produce 90 to 100 cu. yd. of concrete daily. About 50 percent of present-day plants use overhead bins and the rest skip loaders, he said. Overhead bins were to be used in the hypothetical plant under consideration, which means that the legs of the bin must be located where they will not interfere with operations.

A 16- x 20-ft. spacing was decided upon as a good standard spacing to allow plenty of room and provide for expansion. A bin capacity of 150 cu. yd. for aggregates was decided upon as ideal for the plant, with partitions installed at the beginning to accommodate aggregates of different types and grades. A capacity of 150 cu. yd. will run the plant a little more than a day, to provide a reserve for ordinary breakdowns that would not shut the plant down.

A bulk cement bin of 300 bbl. capacity, alongside the aggregates bin was decided upon, but Mr. McCandless qualified his remarks by saying that the capacity decided upon will depend on methods of transportation available. Detroit has bulk cement trucks available and plants can obtain cement on two hours' notice, so a 300-bbl. bin would be ideal.

An enclosed chain-bucket elevator was recommended for filling the cement bin and a belt conveyor for aggregates, inclined over the top of the kilns to conserve space. The latter conveyor should have two speeds, with a vertical height 62 ft. above the ground to provide plenty of height. It would be inclined 18 deg. on 190-ft. centers and have a cover over it.

Under the bins there will be a stationary weigh lorry divided for aggregates and cement, for direct discharge into the concrete mixer. Fifteen feet of headroom should be provided under the bin and above the mixer platform to allow for the mixer, chutes and a cement screw conveyor. A 50 cu. ft. batch mixer was decided upon, for a ten-minute cycle for mixing, with 6 minutes of actual mixing time. A mixer of this size would allow a reserve for making solid concrete units.

Fifteen feet was allowed between the mixer floor and the block machine to allow for the slope of the chute to the machine. Thus there will be available 2½ batches of material, counting a batch in the hopper, a half batch in the chute and a batch in the mixer.

After considerable study of haulage methods, from the machine to the kilns, the fork lift truck was chosen. Units will be piled six high on racks and the kilns will be 13 ft. wide to accommodate two rows of racks sidewise. There will be 6 in. between racks in the kilns, a foot clearance on each side to provide for heating equipment. A maximum temperature of 200 deg. F. will be obtain-

able in the kilns so that units could be removed in 24 hr. and placed directly on trucks for delivery, with safety, in the event the plant is pushed. However, Mr. McCandless emphasized that that would be only in case of emergency. He is a firm believer in having a large stock of units.

A high-lift fork truck, of highway type, will be used for removal of the units from the kilns and piling in the yard so that cores are exposed for pickup with the fork. In his closing remarks, Mr. McCandless told of the use of a circular kiln in Alabama designed to prevent the loss of heat when filling or removing units from the kiln, and he urged that plenty of room be allowed throughout for future expansion.

### Moisture Problem

Mr. Wilk, a manufacturer of heavy-weight slag units and sand and gravel units, handled the discussion of the aggregates. He said that more grading and control of water content will be necessary. One size of gravel will not be enough, for uniform quality he said, in recommending the use of a fine sand, a coarse sand and pea pebbles. Even a third sand might well be used because of variations in the coarse sand. Sands should contain 15 to 18 percent minus 50-mesh fines and approximately 5 percent through 100-mesh is desired for increasing the cement efficiency, he said. If no 50-mesh fines are used, only two-thirds of the strength is realized from a given mix as compared to one containing the recommended fines, according to his tests.

As to moisture in the sand, Mr. Wilk said that tests show sand to bulk as much as 25 percent with 5 percent by weight of water and he questioned whether sand with up to 5 percent moisture should be elevated into bins. He mentioned the practice of certain plants, in frequently not adding water in the first

batches in the early morning, to emphasize how little control was had.

He said that he knew of ready-mixed concrete plants that reduce moisture of 5 or 6 percent to 2 percent by draining sand in ground storage for 24 hr., and advocated the use of a two-day ground storage 8 ft. deep, 16 ft. wide by 75 ft. long with 45 deg. sloping sides. Alternatives are the use of drainage silos or overhead bins.

The ideal way to feed aggregates into bins is into hillside bins with direct dumping from trucks, in gravity plants, but for more average plants the cheapest method is by enclosed belt conveyors, he said. The second choice is a belt-bucket elevator. In conclusion, he emphasized that at least three sizes of aggregates should be provided for and that facilities be plenty ample.

Mr. Warsaw discussed the handling of cement. He said that many plants use cement in cloth bags, which is an expensive practice and one that the workmen dislike. He mentioned that cement in bags costs 5 cents more than bulk cement per bbl. and that the increase is actually 15 cents per bbl., to include the labor cost in handling bags, according to experience in his own plant. A bag cleaner is also needed or an average of ½ lb. of cement is left in each bag and therefore lost to the manufacturer. According to Mr. Warsaw's own experience it requires five men two hours to unload 190 bbl. of bagged cement.

A plant producing 1,000,000 standard units a year uses 10,000 bbl. of cement, or pays a premium of \$1500 annually to use bags. A bin for 250 bbl. of bulk cement would cost about \$5000 installed, he said, which could be paid for in six years by the 15 cents per bbl. saving, when depreciation and interest are figured in the conventional way.

There should be a hopper at the foot of the elevator and a screw conveyor to feed into 7 in. by 12 in. buckets on the chain bucket elevator recommended for handling cement. The cement bin should hold a three days' supply, in his opinion, and have two compartments to provide storage for two types of cement. At the bin, there should be a small screw conveyor to a scale hopper and the screw conveyor should be accurate within a few pounds. A two-speed switch on its drive is preferred so that 90 percent of the cement for a batch can be moved at high speed and the remainder at a "dribble" speed. Air jets to fluff the cement and facilitate the flow of cement from the bin are recommended.

Mr. Berger, in his discussion of mixing, contrasted batch mixers and continuous mixers, for controlling the mixing of aggregates, cement and



Ray Berger, Martin Berger Cement Block Co., one of the experts on plant layout

water. He said that continuous mixers are being perfected for accurate control at lower cost than batch mixers.

He mentioned the location of mixers overhead, on the floor level, above the machine, and below floor level, but mentioned no preference. He did say that the mixer man has the most important job in the plant and that mixes should be proportioned by weight in preference to volume because of the moisture in the sand.

To minimize wear on the mixing blades, he recommended that the blades be set  $\frac{1}{2}$  in. clear from the liner plates and he advocated cleaning and oiling the interior of the mixer at the end of each day. Capacity should be sufficient to permit the production of solid units without retarding production. Following his discussion, Mr. Wilk suggested that plants be kept neat and clean, and expressed the opinion that the need was for a "batch-continuous" mixer.

Mr. McCandless, in discussing handling, said that electric lift trucks cost about twice as much as gasoline trucks but have the advantage of lower operating costs. Paved runways and covered storage were recommended. Mr. Wilk remarked that an unpaved yard will, in the long run, cost more than the paving costs.

RAY BERGER, in his discussion of curing, said the objective in any system of curing was to bring the units to strength and dry them out for delivery as soon as possible. He made the suggestion that curing be done, by a combination of high temperature and moisture and then that the source of moisture be shut off to dry the units before removal from the kilns. The waste in heating pallets and racks each time a kiln is put into operation is one problem that was suggested as in need of study.

In the discussion that followed, Mr. Wilk said that, because the block at the top of the racks are cured better than those at the bottom, a system should be devised whereby the circulation of heat would uniformly cure all the units. He mentioned that a recommendation is going to be made to the Board that sand and gravel block have the specification that the maximum absorption shall not be more than 5 percent.

Other discussion brought out that mixing times should be varied for different aggregates. Austin Crabbs said that there was such a thing as mixing too long with lightweight aggregate. For a 5000 unit plant, Roy McCandless said that a 100-hp. boiler would be required.

Considerable discussion developed on yard handling and loading methods. Mr. Wilk brought out that it is possible with a platform lift truck to go anywhere in a yard within a radius of about 150 ft. for a cost of 23 cents per hundred units.



In the Divisional meeting on heavyweight concrete units, Austin Crabbs, Davenport, Iowa, takes the floor. Ben Wilk is chairman

## Divisional Meetings

**D**IVISIONAL meetings were held for manufacturers utilizing the various aggregates, so that problems peculiar to the several aggregates and products made from them could be discussed in detail.

In the heavyweight divisional meeting, discussion centered around the question of maximum absorption of block and the provision in government specifications for a limit of 40 percent contained moisture in concrete units made from heavy aggregates.

It has been found that in some parts of the country, particularly because of humidity conditions, it is almost impossible to meet the 40 percent contained moisture requirement at all times of the year. Austin Crabbs, Davenport, Iowa, told of tests of moisture content that he has been making every month, from which he has found that with a well-graded aggregate he is able to get a maximum absorption of 5 percent. Mr. Crabbs believes that if a specification for a limit of 5 percent maximum absorption were met, block of such a quality would be produced that a maximum water contained specification at the time of delivery would not be required.

BENJAMIN WILK, Detroit, who presided at the meeting, reported on some tests that his company has made recently on total absorption and absorption at the time of delivery. His tests corroborated those of Mr. Crabbs. From a discussion of the use of air-entraining cements, it was concluded that there was much to be learned as to their application in concrete masonry units.

A working committee was elected, consisting of I. J. Westerveld, Wausau, Wis., Fred Kettenring, Seattle, Wash., and C. E. Swanson, Kansas City, Mo. The committee will try to work out a simple method for determining absorption that will be recommended for use in checking on

absorption by concrete block manufacturers. The sand and gravel unit manufacturers throughout the country will be canvassed for their reactions to establishment of a 5 percent maximum absorption.

### Celocrete Products

In the Celocrete meeting, presided over by Jay C. Ehle, Cleveland, Ohio, discussion centered around general plant procedure, curing temperatures, mixing, moisture conditions, grading of aggregates, the use of Celocrete with Vinsol Resin cement and the need for special cements to make concrete units.

One suggestion made was that a good plastic mix for concrete units could be obtained by using two sacks of high early strength portland cement to one of mortar cement. Several manufacturers reported unfavorable results, in the form of cracking, when air-entraining cements are used. Mr. Ehle reported that he had had good results. In his plant, units are cured under temperatures of 200 deg. F. in modern kilns.

In a discussion of mortars, it was suggested that limits be set on the strengths of some of the mortars in use. Unnecessarily strong mortars will sometimes lead to cracking of units that are up to specifications, as the wall shrinks, said one producer. A committee was appointed, consisting of J. C. Ehle, Austin Crabbs, Davenport, Iowa, and S. C. Davis, Dayton, Ohio, to represent this group.

### Cinder Products

In the cinder divisional meeting, a committee consisting of Philip Paolella, Hamden, Conn., Geo. Goelitzer, Kansas City, Mo., and Carroll Strom, Nashville, Tenn., was elected. Much of the discussion was concerned with quality of cinders.

JOHN S. BAILEY, Atlanta, Ga., J. W. Warren, Knoxville, Tenn., and Wright Smith, Mobile, Ala., were appointed



as a committee to represent the manufacturers of Superrock concrete units in matters peculiar to that group.

## Waylite Products

In the Waylite divisional meeting, much of the discussion was led by Paul Woodworth, who stressed new markets for masonry units. Solid chimney block was one product mentioned that has good market possibilities. Floor tile for tile and joist floors was another. Mr. Woodworth said that the market for floors is in excess of that for wall units in sq. ft. The acoustical ceiling, with light-weight floor units, is a desirable feature from a sales standpoint, he stressed. The housing programs now being planned would have a potential of 800,000,000 sq. ft. of floor tile annually, according to his figures. Acoustical partition units and others were suggested in the meeting.

The committee appointed by the Waylite group consists of Henry Bucholtz, Edw. Prettyman and Paul Bohm.

## Haydite Products

The Haydite concrete products meeting was particularly well-attended and became so enthusiastic in its discussions that it voted to carry over its deliberations from Wednesday to Thursday morning. Walter J. Manhardt of the Best Block Co., Milwaukee, Wis., presided. Chester Smith, a veteran concrete products producer of Canada, and manager of The Cooksville Co., Ltd., Toronto, Ont., told about his production methods of manufacture in which he emphasized particularly the curing process.

A considerable discussion developed over the question of advertising in which Mr. Waters and Mr. Stanley of the American Aggregates Co., Kansas City, Mo., took a prominent part. Among other plans, it is proposed to run a campaign in the *Architectural Forum* to point out to architects, builders, and contractors the advantages of using Haydite concrete products. Mr. Waters stressed the refractory qualities of Haydite as an aggregate. Mr. Smith told about his experience in manufacturing Haydite concrete refractory products. His company makes its own barium carbonate linings for kilns. Mr. Steigerwalt, Haydite Concrete Products Co., San Rafael, Calif., asked whether refractory brick could be made on a block machine. Mr. Smith said that they could but considerable difficulty was experienced in holding to close tolerances. Mr. Smith makes a great many precast bridge decking units of Haydite concrete. Mr. Steigerwalt told about some difficulties he had experienced in making linings for a dehydrator. Mr. Smith said that allowances must be made for heat expansion.

Mr. Manhardt brought up the ques-

tion of trouble experienced in Haydite deliveries where the fines had too much coarse material. It was explained that very often this is a matter of segregation and could readily be corrected.

Mr. Anderson of Crown Sidewalk and Block Co., Minneapolis, Minn., told about his Erickson concrete block machine, made especially for his operations. The mold box is very quickly changed for various sizes.

In the matter of number of block to a sack of cement, Mr. Smith of Toronto said he obtained 30 block per sack. He gets 18c per standard 8- x 8- x 16-in. block. Prices of the smaller block are based on weight in proportion to the standard block. Mr. Steigerwalt of Haydite Concrete Products Co., showed a bond-beam block which was made on a concrete block machine using a special pallet which provides a 2 1/4-in. recess. It may also be used for a lintel. The bond-beam block is required by California law.

Mr. Sherman of Best Block Co., Milwaukee, Wis., served as temporary chairman at the meeting Thursday morning. Considerable discussion followed on the question of manpower problems. Mr. Smith said that the manpower problem has eased up in Canada and expressed the belief that this would soon adjust itself in the States. Mr. Sherman said that his company had merchandised his block by referring to its color as "sky blue." Nailability, light-weight, good acoustics, fire-proofing and strength were some of the merchandising qualities of Haydite block outlined at this meeting.

An executive committee elected for the Haydite group included: I. R. Klein, Western Brick Co., Danville, Ill.; W. R. Stanley, American Aggregates Co., Kansas City, Mo.; Chester Smith, The Cooksville Co., Toronto, Canada; Walter Sherman, Best Block Co., Milwaukee, Wis., and W. E. Barney, Hydraulic Press Brick Co.



John Chase, Fort Worth, Texas, to the right, in a huddle with Claude Chandler, Tulsa, Okla.

## New Standard Building Code

PAUL M. WOODWORTH, director, research and development, Waylite Co., Chicago, Ill., outlined the scope of the new Standard Building Code for Masonry Construction sponsored by National Bureau of Standards and American Standards Association, adopted January 22, at the closing session.

This new standard covers standard materials used in concrete masonry.



W. D. M. Allan, director of promotion, P.C.A., poses with Executive Secretary E. W. Dienhart of N.C.M.A.

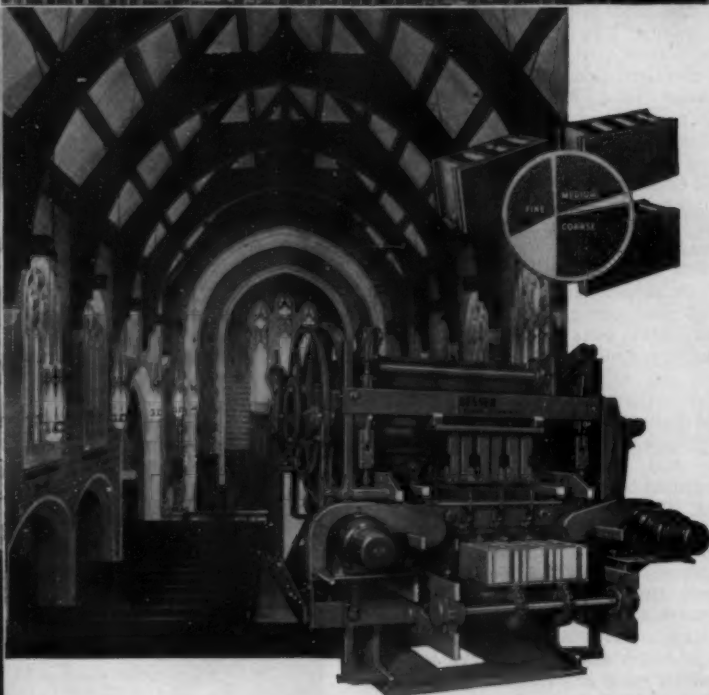
It also includes requirements for its use, such as mortars. Mortar is in four classifications: Type A, for example, must have 2500 p.s.i. minimum compressive strength of 2-in. cubes at 28 days; type B, 600 p.s.i.; type C, 200 p.s.i.; and type D, 75 p.s.i. An alternative strength classification of mortar by volume also has been set up.

Requirements for cavity concrete walls provide (a) that the thickness of solid masonry bearing walls shall be sufficient at all points to keep the combined stresses due to live, dead and other loads for which the building is designed within the limits prescribed by Section 3, Allowable Stresses in Masonry; (b) minimum nominal thickness shall be 12 in. for the uppermost 35 ft. of their height, increased 4 in. for each successive 35 ft.; (c) where solid masonry bearing walls are stiffened at distances not greater than 12 ft. apart by cross walls or by internal or external offsets or returns at least 2 ft. deep, or by reinforced concrete floors, they may be of 12-in. nominal thickness for the uppermost 70 ft. measured downward from the top of the wall, and shall be increased 4 in. in thickness for each successive 70 ft. or fraction; (d) in buildings not more than 3 stories in height solid masonry bearing walls of the top story may be of 8-in. nominal thickness when the total height of the wall does not exceed 35 ft., provided such 8-in. walls do not exceed 12 ft. in height and that the roof beams are horizontal; (e) in residential buildings

(Continued on page 90)

# Concrete Masonry Units For Decorative Treatment

BESSER Vibrapac BETTER Concrete Masonry Units in the hands of skilled architects and builders have become in effect a new building material.



Besser Super Automatic Plain Pallet Vibrapac. Capacity 600 8" x 8" x 16" per hour made 3 at a time on one plain pallet. Smaller units made in larger multiples on the same pallets.

**BESSER  
VIBRAPAC**



## Important Patent Notice

Licensed under the Gellman basic vibration patents.

Unidirectional vibration licensed under Flum patents.

Vibrapac combines vibration with exclusive patented Besser Plain Pallet principle.

## BESSER MANUFACTURING CO.

201 Forty-fourth St.

Alpena, Mich.

Complete Equipment for Concrete Products Plants

THE SAVING IN PALLET COST WILL PAY FOR A BESSER VIBRAPAC PLAIN PALLET STRIPPER

not more than 3 stories in height solid masonry bearing walls may be of 8-in. nominal thickness when not over 35 ft. in height. Such walls in one-story single family dwellings, and one-story private garages, may be of 6-in. nominal thickness when not

over 9 ft. in height, provided that when gable construction is used an additional 6 ft. is permitted to the peak of the gable. The A.S.T.M. specification also provides for uniformity of size of unit. Copies of the A.S.T.M. specification are now available.

## Concrete Masonry Tile and Joist Floor Construction

C. F. MOORE, structural engineer of the Portland Cement Association, presented a very interesting paper on concrete floor systems which was not scheduled on the program. Mr. Moore showed a number of slides. An abstract of his address follows:

"For a long time the Portland Cement Association has felt that the floor tile field offered an opportunity for the concrete masonry industry which had hardly been touched. Several manufacturers have had from fair to good success in their own localities, but nothing has been done to develop this field on a large scale. We realize that there are a number of excellent floor systems such as the precast joist, Flexicore, Postonway, McCracken and concrete plank being promoted and sold by N.C.M.A. members and are sure that some of them will enjoy a greatly extended use. On the other hand, we feel that their use will be somewhat restricted to the areas of these particular manufacturers and that the industry as a whole should also be interested in a tried and proven type of construction that uses standard concrete masonry units and which has been used on all types of construction from residential through commercial and industrial buildings.

"You are probably all familiar with tile and joist construction as exemplified by clay tile. Standard 12-in. clay tile units, 4 to 12 in. deep are laid in rows from support to support, 4 or 5 in. apart on form work and concrete poured in the spaces between the rows and up over the tile to form a slab 2 or 2½ in. thick over the tile. The tile thus forms a core 12 in. wide, and the depth of the tile used in floor construction with solid concrete joists between the rows of tile. Reinforcing is placed in the spaces between the rows of tile to carry the tensile stresses, and cross reinforcing is placed over the tile to take care of shrinkage and temperature stresses.

"The other common type of tile and joist construction utilizes steel tile or metal pan construction. Here steel forms 20 in. wide and 4 to 14 in. deep are placed in rows 4, 5 and 6 in. apart to form a core and concrete is poured between and over the tile as in the clay tile construction. Gypsum tile 20 in. wide, special widths

and types of clay tile, 30-in. wide steel tile and cores of various width formed with wood or plywood have all been used, but the big overall volume has been in 12-in. wide clay tile and 20-in. wide steel tile cores. With the exception of warehouses and industrial buildings requiring heavy floor loads, by far the great majority of commercial and public buildings have used one or the other of these types of floors.

"The widespread use of tile and joist construction from Texas to Minnesota and from Pennsylvania to California is ample proof of its economical and desirable features. Its economy is of course derived from the fact that it replaces a part of the concrete not needed for structural strength by a core or by a much lighter material, which in turn reduces the dead load the floor has to carry. Standard concrete masonry partition units 16 in. wide or special units 20 or 24 in. wide offer a splendid core to use for this type of construction.

"To get an idea of the weight saved by tile and joist construction, the following figures for 6-in. tile with a 2-in. topping and 5-in. joists (rows spaced 5 in. apart) show that: steel tile would weigh 45 lb. per sq. ft., clay tile would weigh 65 lb. per sq. ft., and lightweight concrete ma-

sonry would weigh 60 lb. per sq. ft. An 8-in. concrete slab (6 + 2) would weigh 100 lb. per sq. ft.; 6 + 2 concrete masonry tile and joist using 24-in. wide units and 5-in. joist would weigh 55 lb. per sq. ft.

"When a plaster ceiling is required, clay tile construction has generally proven more economical than steel tile for spans up to 18 ft., with steel tile more economical over 18 ft. Our wider spacing should put us in a little better position, and it would seem that we should be in a good competitive position up to the ordinary 22-ft. classroom spans for school houses.

"We are preparing an information sheet which has complete load tables for concrete masonry tile and joist construction and gives all of the sales and promotion data necessary. There will be complete load tables for architects and engineers and simplified tables for the smaller jobs.

"It should be borne in mind that we are not trying to promote a new type of construction or a new material. All builders are familiar with tile and joist construction, and we are simply adapting standard concrete masonry to this well-known use.

"Everyone of you must know architects who would specify design for this construction, and the contractors would undoubtedly be glad to include the floor tile in the same contract and from the same dealer who is supplying the backup or other masonry units.

"Besides the standard tile and joist construction we are presenting for your consideration the same type of construction without the necessity of a plaster ceiling and with an acoustical surface. This construction would require the use of special units with flanged bottoms. In every other way the construction would be the same as the standard well-known tile and joist construction.

"The clay tile people have sometimes furnished a type similar to this or have furnished soffits to go between the tile and joists and give uniform plaster base.

"One of the drawbacks to clay tile construction has been that the difference in suction between the clay tile fillers and concrete joists has resulted in objectionable streaks or lines in the plaster.

"It would seem that concrete masonry unit construction, because of the more uniform suction of the filler units and the joists, should give a better plaster base than clay tile and surely the soffit type should eliminate the condition of unequal absorption entirely."

At the end of his prepared discussion and slides, Mr. Moore answered questions from the floor concerning this construction.



Harvey A. Lee, Anchor Concrete Products Co., Buffalo, N. Y.



## CONVENTION

### War Production Board Procedure

EDMUND H. BROOKE, Chief, Concrete Products Unit, Building Materials Division, Washington, D. C., told about how the non-metallic section functions. Mr. Brooke said that there were three types of applications for material and equipment which concrete products manufacturers were called upon to make to the War Production Board. The CMP application for reinforcing steel is not essential for most producers as this material can now be obtained in the open market. The L-41 restricts construction, and the WPB 617 is used to get processing machinery including used equipment. He warned producers who were also dealers not to use old stocks of new materials and consider them as used or old materials.

Mr. Brooke said present regulations provide that projects under \$25,000 may be processed by the field offices; over this amount they must go to Washington for approval. Facilities Committee, W.P.B., has become tough as they have held that construction cannot be approved unless it is essential to the War. Industrial construction additions of \$5000 may be approved if priority assistance is not needed. The \$5000 limit is for 10,000 sq. ft. of production floor area.

PD 1-A is to be used to obtain block manufacturing machinery, said Mr. Brooke. In the past applications for block machinery have dealt with actual war construction jobs, such as those in Detroit. Now the applications are on the basis of farm demands for block. Each farmer is now to be considered a war contractor. This is also the attitude of the War Food Administration. Mr. Brooke urged every applicant to send a letter with the application explaining in detail the need for the equipment. Incoming president Fred Reinhold of Buffalo, N. Y., said that the industry is very much concerned about prepa-

rations for post-war business. Mr. Brooke said that nothing could be done to release equipment in anticipation of a post-war demand.

### Price Control

FRED C. BAMMON, Head, Cement and Concrete Products Unit, Building Materials Branch, O.P.A., Washington, D. C., in discussing the question



H. H. Renker, Ideal Builders Supply Co., Cleveland, Ohio

of price relief, reviewed briefly the G.M.P. regulation freezing prices. He said his branch is considering a change in regulations looking forward to the post-war era. It is planned to place all concrete products in one general classification. Prices established in March, 1942, will continue in effect, except local changes in price, such as the Detroit changes. Four pricing methods will be eliminated and the March, 1942, prices will be considered the legal basis or the prices which would have been in effect if the products were manufactured in this period. It is not necessary, said Mr. Bammon, to report such prices to Washington, however, a producer might be called upon to prove that these prices conform to your pricing practice at that time. When a new product is made, the price will be that of the closest competitor. A differential in price will be allowed between classes of customers. A producer can make his own price for a new product for which no competitive experience is available. Mr. Bammon pointed out that the prices for a product made in a temporary plant at or near the site of construction can be based on costs involved in such operation, such as a concrete pipe plant set up at the site.

If no report is received from O.P.A. in 20 days for a price based on these additional costs, the price may be considered as legal, said Mr. Bammon. The increased price can be used during this period, but it must be

stated on the invoice that it is tentative based on approval by O.P.A.

Mr. Bammon referred to price relief based on difficulties of obtaining manpower due to migration to high wage industries. This will be considered by O.P.A. He referred to three general situations where relief can be granted. Relief can be applied on an area basis, such as for the cement industry due to decreased production, but this is not applicable to the concrete products industry. A second provision for relief is on government contracts, such as for 24-hr. a day operation, increasing labor costs. The third is where a local shortage of building materials permits a regional office to make adjustments in price, such as for a big federal housing development. A local investigation is made in the field in this case. If a competitor is willing to operate at old price in area, it is difficult to get relief. It is necessary to furnish considerable cost data in these local shortage cases.

If a War Labor Board case is pending, the O.P.A. should be notified by letter so that action can be taken immediately for price relief in case the Board grants an increase.

Secretary Dienhart cited to Mr. Bammon the new A.S.T.M., increase in strength requirements from 1000 to 2000 lb. concrete, and asked if a general increase might be asked for the entire industry based on increased costs. Mr. Bammon said that individual cases would have to be presented.

Mr. Bammon said that relief denied in the field offices could be appealed to Washington. Mr. Austin asked whether the O.P.A. would recognize the difference in pay scale between open and closed shops. Mr. Bammon said that this would not be recognized in itself as a reason for an increase in prices.

### Financing Plans

At the invitation of Secretary Dienhart, Mr. Lauer of Philadelphia told about a proposed plan to finance concrete houses which involves the formation of the association's own bond and mortgage company. Some financial interests and certain F.H.A. authorities have not been fair in their consideration of concrete house financing. Philadelphia producers have done a notable job in the construction of concrete houses and have taken the lead in this movement of securing better recognition from financial interests.

The convention was adjourned following Mr. Lauer's talk.

### Buy Block Concern

ARBAN BROS. & CAROSI, Alexandria, Va., have purchased the Bethesda Cinder Block Products Co., Bethesda, Md. This concern also produces cast stone at their plant in Alexandria, Va.



R. E. Copeland, P.C.A.

# CONCRETE PIPE

## Developing New Markets and Research Program

American Concrete Pipe Association convention votes to increase merchandising and research activities

**A**N EXPANDED program of activities was undertaken by the American Concrete Pipe Association at its 37th annual convention, held at the Drake Hotel, Chicago, February 9-10. The Association was reorganized in order to accomplish more research directed toward enlarging the markets for concrete pipe.

Discussions of future plans of operation in connection with the enlarged program of activities to be undertaken consumed much of the convention sessions.

O. H. MILLER, president, Choctaw Culvert and Machinery Co., Memphis, Tenn., was elected president. Other officers are Elmer L. Johnson, Concrete Conduit Co., Colton, Calif., first vice-president; L. D. Bailey, The Cre-tex Companies, Inc., Elk River, Minn., second vice-president; and E. E. Brainard, Lock Joint Pipe Co., Ampere; N. J., third vice-president. Elected to the Board of Directors were W. E. Corbett, J. E. Miller, A. J. Wiegand and C. A. Bluedorn.

In accordance with the recommendations of the executive committee, the Association has made a division between the administrative and executive functions and the research and engineering activities. M. W. Loving, secretary-treasurer, has been appointed to the post of consulting

engineer. J. D. Mollendorf was elected secretary and C. H. Bullen, treasurer. T. J. Kauer, assistant secretary and Washington Representative was appointed Assistant to the President.

### President's Address

W. E. CORBETT, in his presidential address, reviewed the activities of the executive committee during the past year, with particular emphasis on the meetings held in connection with the expansion program now being put into effect. He commented briefly on the Association's relations in Washington with the various government agencies.

In his reference to the manpower situation he said that some definite plan is needed as far as the concrete pipe industry is concerned, since the materials are non-critical and easily available. He expressed fear that government agencies will not want to release their control over materials and labor and, in regard to this, expressed the hope that Congress will have the means of releasing materials with minimum delay at the appropriate time.

Mr. Corbett is opposed to the proposed program for expenditure of a billion dollars annually for three years on public roads, as it is outlined in its present form. He believes



O. H. Miller, president Choctaw Culvert & Machinery Co., Memphis, Tenn., new president, American Concrete Pipe Association

the proposed matching of 75 percent federal funds with 25 percent non-federal money will give the government too much opportunity to control the program through some bureau and believes the ratio should be 50:50.

In discussing the program further, he expressed the opinion that it was not predicated on the basis of State needs and that no consideration was taken of costs and employment to be provided. He concluded his remarks by saying that the total present debt of the states is less than the interest on the federal debt.

### Secretary-Treasurer's Report

M. W. LOVING, secretary-treasurer, in his annual report, reviewed the growth of the industry from 1920, when there was but a handful of plants in a few scattered localities, through 1943 when there were more than 300 plants that produced 4,000,000 tons of pipe in a single year for sewerage, drainage, water and irrigation. Fifty-eight concerns, with 55 percent of the 1942 record tonnage, comprised the membership in 1943, he said.

He mentioned a few, but very important, instances wherein the Association made studies and satisfied the users in cases where failures of pipe had been claimed, thereby saving the business for concrete pipe. He also mentioned some instances where the Association had made definite engineering recommendations that prevented improper selection or use of concrete pipe on large projects. In one instance, 12- to 14-in. concrete culvert pipe had been selected to

(Continued on page 94)



To the right is W. E. Corbett, Corbett Concrete Pipe Co., Milford, Mass., retiring president, talking with C. A. Bluedorn, left, and J. H. Bailey, center



## Performance

### Speaks Louder than WORDS

STANDARD CONCRETE  
PRODUCTS CO.  
York, Pa.

Two #7 Joltcretes

E.L. RAMM CO.  
LaGrange, Ill.  
One #7 Joltcrete

HUDSON SUPPLY & EQUIP. CO.  
Washington, D.C.  
Two #9 and two #7 Joltcretes

ask a **STEARNS** owner



This Model 7 Joltcrete makes six to seven 8 x 8 x 16-in. concrete blocks per minute—dense, clean, true-to-dimension blocks free from core bar or other cracks. Handles all types of aggregates with equal facility. Other models of larger capacity. Write for folders.

## WHEN YOU BUY STEARNS— YOU BUY "KNOW HOW"

In the field of concrete products manufacture STEARNS represents the combined experience, the "know-how," of two generations devoted exclusively to the design and production of concrete products plant equipment.

STEARNS pioneered the development of machines for producing concrete masonry units by vibration. The result was, and still is—Stearns Joltcrete Machines. Facts and figures, which we will gladly submit, clearly prove them to be the most economical machines of

their type your money can buy. They represent what we mean by "know-how"—the "Know-How" that stands as a promise of satisfaction behind our name.

*Permit us to explain proper  
priority procedure*

# STEARNS

GENS OLSEN, PROPRIETOR

Licensed under the basic Gelman Vibration Patents. Also  
manufacturers of Clipper Stripper block machines (tamp type)  
—Mixers—Skip Loaders.





## **"ANCHOR"**

### **Complete EQUIPMENT AND ENGINEERING SERVICE**

Equipment for all phases of manufacturing concrete cinder block and other lightweight aggregate units. Our engineering service for new plants and modernizing old ones will help you operate more economically.

Hobbs block machines, Anchor tampers, Anchor Jr. strippers, Stearns power strippers, Stearns Joltcrete, Stearns mixers, pallets, Straublox Oscillating attachments, etc.

Repair parts for Anchor, Ideal, Universal, Stearns, Hysions mixers and others.

**Anchor Concrete Mch. Co.**

1191 Fairview Ave., Columbus 8, Ohio

## **CONCRETE PRODUCTS MACHINERY**

### **MIXERS**

Continuous and Batch

### **BLOCK MACHINES**

Vibra-Press and Strippers

### **ELEVATING EQUIPMENT**

Aggregate and Concrete

### **TRANSMISSION MACHINERY**

Pulleys and Couplings

### **PALLETS**

Pressed Steel or Cast Iron

### **TAMPERS**

**THE KENT MACHINE CO.**

CUYAHOGA FALLS • OHIO

carry water through a 5500-ft. line under a 30-ft. static head where the water temperature was subject to variations in temperature of 40 deg. F. to 140 deg. F. in 24 hr.

This was clearly a case of specifying the wrong pipe, said Mr. Loving, since the culvert pipe had not been designed to withstand hydrostatic pressures and failure would have resulted. Reinforced concrete pressure pipe was recommended for the job by the Association and the same member got the contract. In concluding, he mentioned some of the important booklets published, and said



C. A. Bluedorn, Zeidler Concrete Products & Machinery Co., Waterloo, Iowa, one of the new directors

that since 1921 the Association has concentrated its efforts in the development of a market through educational work designed to gain the confidence of engineers.

A. J. KAUFER, assistant secretary and Washington representative, in his annual report, gave a lengthy summary of his activities and experiences with Washington agencies during the past year and told of his visits

to concrete pipe plants and of job inspections he has made. One of his general observations was that industry is now geared for war and that governmental authority has become more decentralized.

He commented briefly on the reclassification of concrete pipe, for priority purposes, which has enabled the industry to get advance allocations of steel from W.P.B. Reinforcing steel is no longer critical, he said, although sheet steel and plate steel are. He believes that steel of the type used by the industry will be released from priority control when Germany is defeated.

The industry, through the Association, opposed the proposed price ceilings to be set by O.P.A. on the grounds that established prices on installed drainage lines would be impractical, have no value, and would cause confusion. Proposed prices as set up would not permit adjustments due to changes in rates for labor and would not take into consideration changes in installation costs which would vary due to seasonal effects on earthwork and for other reasons. The O.P.A. has, for the present, abandoned the establishment of prices for the industry, but consideration will soon be given to the establishment of prices to cover new companies, plants at new locations and new products.

In commenting on the Civil Aeronautics Authority, Mr. Kauer said that too much authority had been given to field offices and it will therefore be necessary to work closely with the local organizations in the interests of concrete pipe. He believes that the Smaller War Plants Agency set up by government may be helpful in finding some business for the concrete pipe industry.

Work on the new federal specification for non-reinforced concrete culvert pipe to meet the competition of extra strength clay pipe is progressing, he said.

Conflicting statements put out by



M. W. Loving, consulting engineer, A.C.P.A., on left, visiting with W. S. Gearhart, Standard Concrete Pipe Co., Springfield, Ill.

the War Manpower Commission have made the manpower situation bad. At first the industry had been granted an essentiality rating but the decision was later reversed. Mr. Kauer said that many companies, however, have benefitted by getting their operations classified as locally-needed activities.

Considerable research, under field service conditions has been accomplished, he said, in commenting on his contacts with engineers in Washington. E. F. Bepalow, chairman of the Technical Problems Committee, reported on those activities in another meeting.

The executive committee, in its annual report, recommended the reorganization of the Association as mentioned earlier and outlined a program of activities that will greatly enlarge the scope of the Association. Among the proposals are an enlarged research program, a code of ethics for membership as regards product quality, an advertising and educational program to stress the value of concrete pipe in the postwar building program and the formation of regional organizations as component parts of the national Association. It was also decided that new national offices be established in Chicago.

In the later discussion Mr. Blue-dorn told of the unusually rigid tests applied in the State of Iowa to check for the accuracy of alignment of re-



Left to right: G. H. Redding, Massey Concrete Products Co., T. J. Walsh, Nelson Concrete Culvert Co., and H. Eschenbrenner, Universal Concrete Pipe Co.

inforcing steel in concrete pipe. Mr. Chutter told about the steps taken in California that were successful in having concrete pipe classified as locally needed, thereby permitting the producers to hold their labor and hire new employees.

Twenty-five new members were admitted into the Association in 1943, including two associate members.

#### Airport Design Problems

At the afternoon meeting, Wednesday, February 9, President Corbett

asked H. W. Chutter of Jourdan Concrete Pipe Co., Fresno, Calif., to introduce the speaker, O. J. Porter, senior physical testing engineer, Department of Public Works, Division of Highways, State of California. It was explained that Mr. Porter has been on loan to the army and navy air services as a consultant on airport construction. Mr. Porter said that the first thing to know when building an airport is the load to be carried and how much of the load is to be carried by the soil. He said that excessive

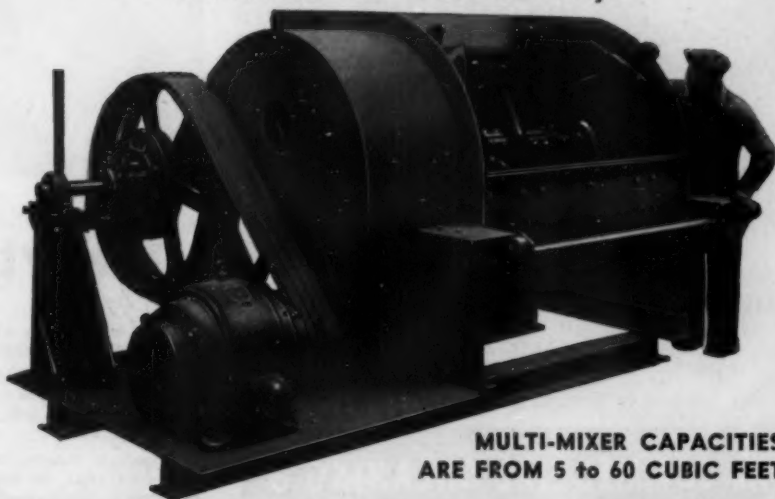
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H. W. Easterly, Concrete Pipe & Products Co., Inc., Richmond, Va., on left, with J. C. Helms, president, Helms Concrete Pipe Co., Inc., Alexandria, Va.



H. W. Chutter, Jourdan Concrete Pipe Co., Fresno, Calif., one of the discussion leaders

bending and deflection is the cause of failure rather than the pavement design itself. The difficulty in designing an airport pavement, he said, is to keep up with the tremendous strides in aircraft size. Airport loads have tripled and in some cases have increased 20 times. You can't design airports to take care of the heaviest type of airplanes which may be built in the future, he said. Air line authorities are talking of planes holding 400 passengers.

Present standards call for airports

designed to carry four types of wheel loads: 1—pavements to carry 5000-lb. wheel loads for light planes; 2—pavements to carry 15,000-lb. wheel loads for heavy planes; 3—pavements to carry 37,000-lb. wheel loads for planes such as the Flying Fortress; and 4—pavements to carry 60,000-lb. wheel loads for the super Flying Fortress. Future designs contemplate wheel loads of 300,000 lbs.

Taxi-way pavements have to be built to take into consideration frequent repetition of loads. Studies in-

dicating vibration of motors and frequency of load have a serious effect on runways, said Mr. Porter, due to compaction. Contrary to general belief, failures of pavement are not due primarily to the plane landing as most of the weight is air-borne on the wings. Troubles developing to airport drainage systems result from the fact that the soil and water act like solids on impact. Serious trouble often develops from comparatively slow moving loads. Mr. Porter showed

(Continued on page 98)



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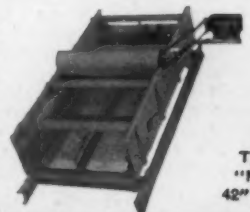
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## Going After More Production

### Midwest Agricultural Limestone Institute annual meeting discusses manpower and trucking shortages

**T**HE MIDWEST Agricultural Limestone Institute had its annual meeting for the election of officers in Springfield, Ill., February 22. The officers were all reelected and all the directors except one. There was considerable informal discussion, particularly with reference to the problem of the large commercial crushed-stone operations, which, lacking commercial business now, must find some way to convert to production of agricultural limestone as a primary product.

It appeared that nearly all present were increasing their plants' productive capacities, although they were very hedgy as to just what they were doing. Apparently, none was having any trouble getting new machinery for increasing capacity. New pulverizers are being installed in several plants.

The man-power shortage continues to be the chief bottleneck. Although the War Food Administration and the Agricultural Adjustment Administration have both promised to use their good offices in getting deferments for employees of agricultural limestone producers, some employers feel it a greater patriotic service to let their men called up go into the armed services. Where a man's own sons are in the armed services he sometimes isn't so keen for asking exemption for employees.

The trucking shortage is also being felt, but some producers intend to solve this by operating their own trucks, or by establishing new trucking contractors to take the place of those drafted. The Federal Government (mostly the Army now) is beginning to release trucks that have been used for construction, and some producers have already had a chance to bid on these.

Price ceilings have been raised for several producers, in accordance with the formula given by Henry A. Huschke, Fertilizers and Insecticides Branch, O.P.A., in Rock Products, February, 1944, p. 110. The price increases are mostly 10 and 15c per ton, designed to cover increased costs of producing agricultural limestone without the accompanying commercial stone. It would appear that this is not sufficient increase to cover costs unless ballast or commercial stone is also produced.

JOHN R. SPENCER, Soil Improvement Department, Illinois Agricultural Association, gave a brief talk in which he said that the estimated consumption of agricultural limestone in Illinois in 1942 was 3,800,000 tons and in 1943 3,600,000 tons. In 1942 there were 134 producers in the state. He said the fineness of the product was being stepped up a little;

at least 80 percent should pass an 8-mesh screen.

Mr. Spencer said that all economic circumstances, except the labor situation, favored a record consumption of agricultural limestone this year. The farmers have lots of money and can find little to buy with it. The A.A.A. and W.F.A. both are urging greater use of limestone.

The following officers were re-

elected: President, E. J. Krause, St. Louis, Mo.; vice-president, Dan Sanborn, Kankakee, Ill.; treasurer, H. A. Clark, Chicago, Ill.; secretary, Floyd W. Mumma, Decatur, Ill.

### Dredge Boat Fire

BEDFORD-NUGENT Co., Evansville, Ind., suffered a fire loss on its Digger No. 6 sand and gravel dredge boat. The entire superstructure, including the dredging equipment, was largely destroyed, but the hull can be repaired according to company officials. The equipment aboard the barge is Diesel operated, and serious complications were avoided when 2,000 gal. of Diesel fuel oil in drums on the barge failed to catch fire.

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CHAIN BELT COMPANY OF MILWAUKEE  
CONSTRUCTION MACHINERY



## Concrete Pipe Convention

(Continued from page 96)

some interesting slides to illustrate the effect of loads and impact on highway pavements.

In the discussion which followed the importance of proper backfilling for concrete pipe installations was emphasized. In a heavy clay soil the trench should be comparatively narrow so that the soil itself would serve as a span in carrying the load. In light soil, the trench should be wider and the backfill aggregates carefully graded and tamped to distribute the load through covering soil.

## Cast Stone Institute Meeting

Perfecting new products to broaden outlets for cast stone manufacturers

**A**N ENTHUSIASTIC group of cast stone manufacturers came from all parts of the country to attend the annual convention of the Cast Stone Institute held at the Bismarck Hotel, Chicago, February 14 and 15. The program was designed to develop ideas and plans for the members and the Association to follow in extend-

ing the markets for cast stone and in developing and perfecting new products to broaden outlets. The attendance was excellent and there was full participation in the exchange of ideas.

The 1943 officers and directors were reelected. The officers are E. A. Wiedemann, Richmond, Va., president; Edward Olsen, Oshkosh, Wis., vice-president; and O. L. Formigli, Berlin, N. J., secretary-treasurer. L. G. Young, Cleveland, Ohio, and A. J. Downing, Washington, D. C., complete the board of directors.

President Wiedemann, in his address, paid high tribute to Managing Director C. G. Walker for his efforts in behalf of the membership and thanked the Edmonds Art Stone Co., Washington, D. C., for its generosity in making its facilities available to the Association and members since the headquarters were moved to that city from Chicago. Mr. Wiedemann recommended that a program of promotion and advertising be undertaken in order to extend the markets for the industry's products. He suggested that direct mailing pieces be prepared and printed so that each member could send them to his own mailing list.

### Managing Director's Report

Managing Director Walker, in his annual report, stressed the importance of group action as contrasted to individual action in the development and perfection of standardized products. He stated that a trade association should be of service to the industry's customers as well as to its own members, and that the only justification for its existence is to promote and protect the industry through cooperation.

He stressed the need for new products now that the demand for cast stone is falling off, and said there are enough good ideas for new products to keep the industry going to capacity if the ideas are developed on a national scale. Aggressive promotion will be needed, he said, but new products should be gotten into actual production before an attempt is made to sell them. He mentioned the precast concrete manholes, which were developed by the Institute, to stress what actually can be done with a new product through standardization and promotion on a national scale.

### Business Building Ideas

M. A. ARNOLD, Arnold Stone Co., Greensboro, N. C., when called upon to sound the convention keynote, reviewed the past and called upon the industry to keep the quality of its

(Continued on page 102)

# Steelcar

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## AIR DUMP CAR

It happens occasionally that an unusually steep dumping angle is required to insure rapid and clean discharge of materials that are sticky and difficult to dump. The nickel bearing ore in this instance required the extreme angle of 65° from horizontal and the cars were furnished accordingly. These cars are required to dump to one side only; therefore, dumping cylinders are installed only on one side and likewise cars are constructed

with one door, the other side being stationary. A large radius is provided at intersection of floor with stationary side and ends to further assist in freeing the load. Dumping cylinders are of the triple telescopic type to secure the long travel necessary to move the body to a dumping angle of 65° and at the same time, economize in the use of compressed air.

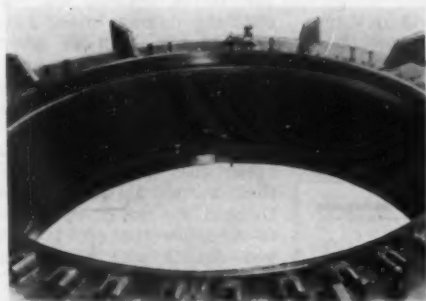
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### MECKUM SUPER FEATURES

- ★ Lower pump shell costs
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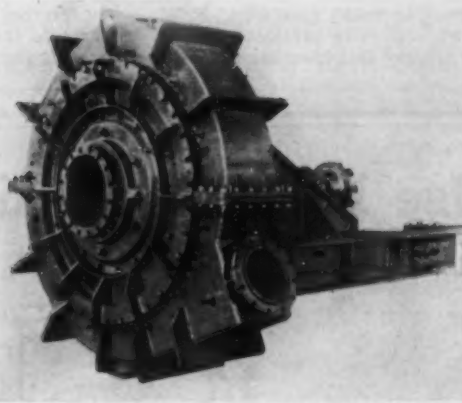
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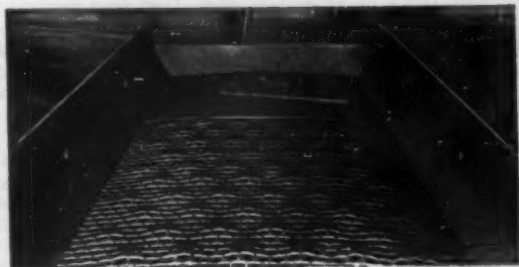
MECKUM liners form a self-locking arch when in position, and are easily installed or removed, saving pump replacement costs.



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Reduced to  
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These heavy plate steel constructed roller bearing jaw crushers have tremendous crushing power, take most severe punishment.



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## Combatting Alleged Damage from Blasting

**T**HE SESSION of the convention of the National Crushed Stone Association on the morning of February 2 included a very interesting and instructive discussion of the ways and means of combatting alleged damage from quarry blasting, which after several years of comparative quietude has again become a real problem with many producers. F. W. SCHMIDT, Jr., vice-president, North Jersey Quarry Co., Morristown, N. J.,

presided and Dr. L. DON LEET, associate professor of seismology, Harvard University, talked on "Modern Methods of Investigating Alleged Damage from Blasting."

Dr. Leet had the faculty of presenting his subject extemporaneously in understandable language and with a lot of human interest. He referred in highly complimentary terms to the thorough work done by Dr. Edward H. Rockwell, Easton,

Penn., and J. R. Thoenen, U. S. Bureau of Mines, which provided accurate scientific data on all aspects of the vibration problem. Dr. Leet expressed his opinion that most claims for blasting damage were a form of racket, and so far as his own experience went, every claim for damage was fraudulent. He had a hard time, he said, sticking to cold scientific terms, because the very idea of claiming damage made him hot.

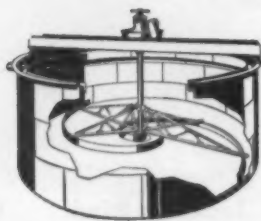
With the help of a blackboard sketch, Dr. Leet explained the elementary principles of a seismograph and how it registered earth vibrations within 1/10,000 inch. From a study of quarry blast vibrations a great deal has been learned about their nature as well as their extent. He said the use of upright steel pins to measure the effect of vibrations was simple and easily understood. The effect of vibrations on the pins has now been related to seismograph measurements. He said if any pin remained standing, the vibration, or earth movement, was less than any that could possibly have caused damage to a building or structure. The tendency is for the pins to fall over too easily; they are really more sensitive than necessary for the test. The use of pins is now a bona fide legal procedure, and the evidence they supply can be used in court.

Dr. Leet then described in considerable detail the nature of earth vibrations caused by blast-hole explosives. The energy which causes the vibration is that left over from breaking the rock, and consequently the more efficient the use of the explosive in blasting, the less energy is available for the earth vibration. In one instance the left-over energy was actually determined and found to be less than 1/10 of 1 percent of the total energy of the explosive. It is the psychological effect of the vibration that causes people to think damage is done, because the human body is extremely sensitive to these vibrations.

Vibration waves, Dr. Leet said, are of three different types. The surface vibration, which is most important, has a wave length of 100 to 300 ft., and does not extend in depth to more than 1/2 the wave length. The nature of this wave of vibration depends greatly on the character of the media it travels through; this factor is called the foundation coefficient and may be as high as 10, but in general it is not over 3. It depends on the elasticity of the medium. Thus in solid rock the vibration is much greater in amplitude than on soft ground, but the harm it may do is much less because it vibrates the structure as a whole. In soft ground the vibration soon dies out, but it can do more harm there with less amplitude.

Dr. Leet said that at a distance of over 2000 or 3000 ft. buried dynamite

## Use Hardinge Thickeners



### Extent of Use

Several hundred Hardinge Thickeners are operating in metallurgical and chemical plants in sizes from laboratory units to large projects.

### Mechanical Features

Auto-raise protects scraping and driving mechanism from overload. Spiral scraper insures rapid and positive removal of solids.

### Design Available

Standard steel, also stainless steel, wood and rubber covered mechanisms for use in corrosive liquids.

### The Tray Thickener

With take-off of solids from each department results in maximum settling capacity per square foot of floor space.

Bulletin 31-C

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(in a blast hole) could not possibly do any harm, regardless of the size of the charge. There are always incidents that illustrate the absurdity of damage claims. Cracks caused by temperature change or foundation settlement can be scientifically determined. There is ample data on record to combat all claims.

PROF. JOHNSON, of Rutgers College, brought up the point that vibrations in unconsolidated material, on the side of hills, geologically called talus, cause movement of the materials, particularly creeping in winter and spring, and that this could cause building cracks and failures. He also asked about the cumulative effects of blasting, which might cause failure from fatigue in building materials.

DR. LEET said fatigue could play no part, that it would take millions of repetitions to produce fatigue in modern kinds of building materials.

### Vermiculite in the War

BUREAU OF MINES has issued an interesting report, "Marketing Vermiculite," which outlines the new uses which have been found for this mineral. The market has increased from approximately \$160 in 1924 to \$4,000,000 in 1942. Because it sometimes expands or exfoliates to 16 times its original volume when heated, vermiculite has found widespread use as an insulating material and recently has been employed quite extensively as a lightweight aggregate in concrete. Among its more important war uses, other than as an aggregate for concrete, are for loose fill in packing shells and bombs and in some life preservers, insulation for soundproofing in motor vehicles and airplanes, structural roof slabs for buildings in war construction areas, and special firewalls and deck coverings on tankers likely to be subjected to bombings. This publication was prepared by G. Richards Gwinn, associate mineral economist of the Bureau. Commercial production of vermiculite is reported from deposits in Colorado, Montana, North Carolina, South Carolina, Wyoming, California, Nevada, and Pennsylvania.

### Construction Falls Off

TOTAL VOLUME of construction activity in the United States in November, 1943, was \$401,298,000, 13 percent less than the October, 1943, activity and two percent under the November, 1942, schedule, according to a W.P.B. announcement which was recently issued. This volume of \$401,298,000 comprised the four major classifications: (1) Military, \$132,984,000; (2) Industrial expansion, government and privately financed, \$96,514,000; (3) Housing, government and privately financed, \$101,800,000; and (4) all other construction, including public roads, sewers, community buildings, utilities and other non-residential, \$70,000,000.

## There's No True Substitute for Manganese Steel in Crushing Service

Manganese steel, first made 60 years ago, was employed soon after its inception for crusher elements such as roll shells, mantles, and jaws. During all this period quarry operators have found no other steel that will give the long, economical performance made possible by the ductility and wear-hardness of "the toughest steel known."

Today almost every maker of crushers incorporates manganese steel wearing parts into his new machines, whether jaw, gyratory, cone, roll or hammer type; and most of them use Amsco manganese steel. They also are able to fill promptly users' orders for identical repair parts.

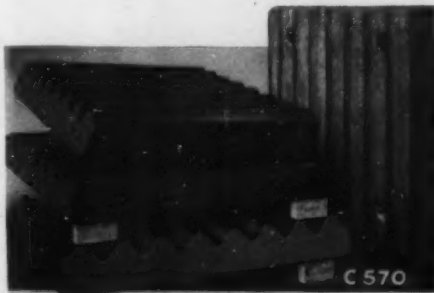
If and when a more economical metal is developed for crushing service, Amsco will be making it. In the meantime all experience proves the superiority in performance and ultimate economy of austenitic manganese steel.

Your order sent to the crusher manufacturer, specifying Amsco manganese steel, is the best way to quickest service and guaranteed fit. Bulletin 642-C describes all applications in crushing service.

C-570—Crusher jaws like these are made in all sizes of Amsco manganese steel.

A-117—Besides first-class abrasion resistance, "the toughest steel known" offers unequalled ability to resist breakage from shock stresses.

R-444—A three-part gyratory crusher mantle, weight 13,000 lbs.



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OFFICES IN PRINCIPAL CITIES

## Cast Stone Convention

(Continued from page 98)

products to the highest practicable level. He urged that the members contribute their ideas for new products into a national pool that could be used for national merchandising.

He said that rather than to cut quality to meet price competition, a cast stone manufacturer should either get out of business or he could do one or more of the following: Develop distinctive non-competitive products, diversify, specialize on certain products suitable to his own area or cooperate collectively with other members in developing and promoting his business.

In the discussion that followed, AUSTIN CRABBS, Davenport, Iowa, said that he has established a downtown store for paints, wallpaper and other building supplies that is probably the largest in Davenport. A few years ago he handled paints and steel sash on a small scale, as a supplement to his regular business and a big business has resulted. The location is helping to sell precast concrete to individuals who otherwise would not bother to go out to the plant.

J. W. LEWIS, American Concrete Corp., Chicago, who produced the Glastone units used on Chicago's subway stations, discussed the principles of manufacturing these units,

from the standpoint of the equipment involved, to point out that Glastone is a product that could easily be adapted to a cast stone plant as a supplemental product that will be merchandised nationally. The manufacture and application of Glastone units were described in full in ROCK PRODUCTS, November, 1943, page 93 and December, 1943, page 80.

## Glastone Promotion

Mr. Lewis said that the product would be promoted through architects, just as cast stone is sold, and is manufactured on vibrating tables with mixers, forms and other equipment that the cast stone manufacturer already has. He further commented that the colors are standardized, no polishing is required, breakage is low and that the units are handled and packed like cast stone. As to their acceptance, he said that Glastone sells itself on its finish—and that it is patented and protected by the Libbey-Owens-Ford Glass Co.

E. C. JOHNSON, Libbey-Owens-Ford Glass Co., discussed the development of Glastone, outlined its applications and plans for its promotion and illustrated its applications by slides of actual jobs completed. Chain store fronts, office buildings, industrial buildings and other types will take a tremendous volume according to interest shown, he said. With reference to the Chicago subway, he said that 70 percent of the square footage consisted of rounded units with bent glass facing and that 30 percent was of slabs 1½-in. thick. The maximum size for efficient handling and installation measures 8 sq. ft., according to experience. Questions were answered in regard to mixes, compressive strengths, aggregates and the forming and handling of units faced with bent glass. An inspection trip was organized to inspect Glastone jobs in the Chicago area and, in an evening meeting, there was a discussion of conditions and obligations of franchises in the manufacture and sale of Glastone.

EDWARD OLSEN presided over a session devoted to a review of wartime developments in precast concrete specialties that brought out a number of suggestions for new products. There developed considerable discussion as to the practicability of exchanging ideas. One manufacturer suggested that special dues be assessed to members manufacturing any new products copyrighted by the Institute, with a portion of the dues to be turned over to the originator of the idea. Another thought was to appoint a board of review to limit the marketing areas for such products in order to protect the originator.

## New Markets for Cast Stone

JOHN RUHLING, Cement Products Bureau, Portland Cement Association,

(Continued on page 106)

## For Off-the-Pavement Work . . .



## HYSTER Pneumatic Tire Fork Lift Trucks

- Designed for hauling short distances and for loading, unloading and stacking.
- Equipped with pneumatic tires HYSTER Lift Trucks are not limited to use on paved floors and runways, but like the unit in the picture can readily operate on unpaved surfaces.
- HYSTER Lift Trucks are built in capacities from 2000 lbs. to 15,000 lbs., all with gasoline power and pneumatic tires.

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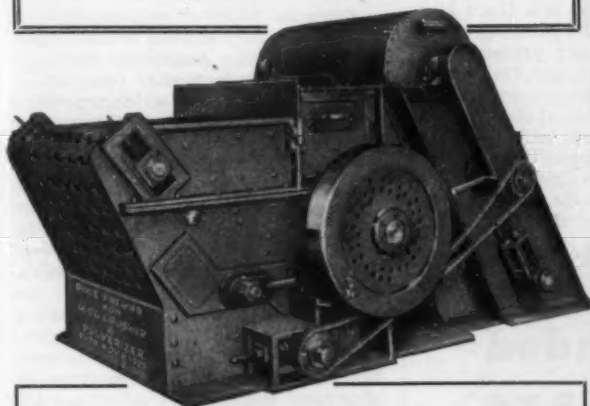


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3. Crushing phosphate muck in T.V.A. Tennessee plant.

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The Dixie Non Clog Hammermill is the only crusher with a moving breaker plate. Provides positive mechanical feed. No manual pushing of material needed. Even the most plastic, wet, clayey material will not slow production or clog hammers. This feature alone has saved the cost of 10 men in one company!

And because the Dixie moving breaker plate can be moved forward or backward from the hammer points, quality and size of production can be controlled. This feature provides additional assurance against clogging. These are but two of Dixie's outstanding features. Send coupon below for free booklet, "More Efficient Crushing of Raw Materials" which gives complete facts.

### DIXIE MACHINERY MFG. CO.

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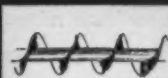


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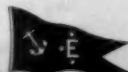
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## Mexico Cement Industry Expands

SINCE the boom time building of cement plants in the United States during the "twenties" there probably has not been experienced in the rest of the world the activity shown in Mexico during the year 1943 which promises to extend over into 1944 and for some time thereafter. Existing cement plants have with few exceptions installed additional machinery to double their capacities; new plants have been built; other plants are being built, and a great many plants are still being "talked."

Cemento de Mixcoac, S.A., initially built in the early "thirties" consisted

of one 8- x 10- x 285-ft. kiln. Several years ago a second 9- x 90-ft. Lepol kiln was installed and placed in operation. Also ordered several years ago but held up due to priorities and only recently received and now in the process of installation is a third kiln 8- x 10- x 285-ft. The Mixcoac plant operates under the dry process with the exception of the Lepol kiln which follows the semi-wet process. The expected total capacity of this factory scheduled in January is 750 metric tons of portland cement daily. Plant is located in Mexico City.

La Tolteca, Compañía de Cemento Portland, S.A., one of the oldest pro-

ducing cement companies in Mexico, operated one 8- x 125- ft. one 8- x 135-ft. and one 8- x 150-ft. kiln until the year 1942 when a fourth kiln 9- x 10- x 170-ft. was installed. This factory has a production of about 400 metric tons daily.

### English-Owned Companies

Both the Mixcoac and the Tolteca companies are English owned subsidiaries of the Associated Portland Cement Manufacturers, Ltd. which has somewhere near 40 cement factories located in Great Britain and scattered in other parts of the world.

For a great many years the two English cement factories have accounted for approximately 45 percent of the total cement production in Mexico.

Cementos Mexicanos, S.A., at Monterrey, State of Nueva Leon, has for a number of years operated two 9- x 120-ft. kilns under the dry process. A third kiln, 10- by 175-ft. is now being installed, and upon completion of present construction scheduled for the early part of 1944 estimated daily production will be 500 metric tons.

### Operated by Employees

Cooperativa Manufacturera de Cemento Portland, S.C.L. "La Cruz Azul" is the oldest established cement factory in Mexico and is located at Jasso, State of Hidalgo. This plant has three 8- x 135-ft. kilns and produces 220 metric tons of portland cement daily. For the past several years the Cruz Azul company has had under construction a small factory at Lagunas, State of Oaxaca, comprising one 7- x 9- x 160-ft. kiln from which a capacity of 100 metric tons of portland cement is expected daily. It is thought likely that operations at this new plant will not start before Spring of 1944.

Compañía Mexicana de Cemento Portland "Apasco", S.A., was formed in the early thirties and after some years of reorganizations placed a 6- x 8- x 150-ft. kiln in operation during the middle thirties with a capacity of 90 metric tons of portland cement daily. In recent months a second kiln, 8- x 135-ft. has been installed and total capacity is expected to reach 210 tons daily.

Cementos Hidalgo, S.C.L., is another of the older plants in Mexico, consisting of four 7- x 100-ft. kilns, but production has only averaged about 120 tons of cement daily. (It may be noted here that the Cruz Azul plant was some years ago acquired by the Tolteca company, which upon completion of its newer plant at Mixcoac, Mexico City, shut down the older Cruz Azul plant. At that time the Cruz Azul plant was expropriated by the Mexican Government, turned over to the workmen for operation as a cooperative plant, and the owners were eventually paid a nominal price for it. Later, the Hidalgo company, owned by Cementos Mexicanos was also shut down, and in turn expro-

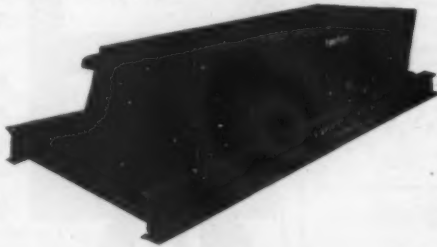


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Right: A 5'x12' Model D double deck *Simplicity* gyrating screen.

**Simplicity**  
ENGINEERING COMPANY • DURAND MICH.

propriated by the Mexican Government and turned over to the workmen for operation. To date it is not believed that the original owners have been reimbursed for plant.)

Cemento Portland Nacional, S.A., operates a single 8- x 150-ft. wet process kiln at Hermosillo, State of Sonora. This is the only wet process plant operating in Mexico and its production is 80 metric tons of portland cement daily.

Cementos Atoyac, S.A., located at Puebla, State of Puebla, initially operated but one kiln 6- by 70- ft. In the late twenties a second kiln 6- x 133-ft. was installed, and in the early thirties a third kiln 8- by 133-ft. was installed. During the early part of 1943 a fourth kiln 8- x 133-ft. was installed, and at the present time the plant is undergoing a large construction program which will terminate early in 1944 and result in two 6- x 133-ft. and two 8- x 133-ft. kilns having a production of 250 metric tons of Portland-Pozzolana cement. This company abandoned the production of portland cement about ten years ago and has since produced cement of the Portland-Pozzolana type.

Cementos Guadalajara, S.A., with plant at Guadalajara, State of Jalisco, is the latest new plant to be placed in operation. Two 6- x 120-ft. kilns were placed in operation during June, 1943, and construction started immediately on a third kiln 7- x 135-ft. that was placed in operation during December, 1943. This new plant also produces Portland-Pozzolana cement at the rate of about 200 metric tons daily.

Cementos del Pacifico, S.A., at Mazatlan, State of Sinaloa now has under construction a one-kiln plant (8- x 150-ft.) and sometime during the latter part of 1944 should be in production at the rate of about 100 metric tons of Portland cement daily.

#### New U. S. Capital

Cementos Veracruz, S.A. (subsidiary of Cementos Atoyac, S.A.), also has under construction a two-kiln (8- x 125-ft.) plant at Orizaba, State of Veracruz. These kilns will operate in connection with waste heat boilers, and will produce about 200 metric tons of cement daily. The Marquette Cement Manufacturing Co., Chicago, Illinois, holds the preferred stock in the new Veracruz company.

Cementos, S.R.L., producers of masonry cement at present, have for some years considered building a one-kiln (8- x 125-ft.) plant at Tlalne-pantla, State of Mexico, but have to date done no actual construction.

Cementos del Norte, S.A., is a newly formed company that plans to put in the necessary grinding equipment to produce 400 metric tons of slag-cement daily. Clinker would be acquired from the Monterrey plant of Cementos Mexicanos and slag from the Monterrey Steel mills. Plant is to be located in Monterrey.

Cia. Oriental de Cemento Portland,

S.A., is a newly formed company in which the Universal Atlas Cement Co. (subsidiary of U. S. Steel Corporation), New York, has a direct interest. This company is investigating a number of sites and has announced, but has not as yet started, construction on plants at Orizaba, State of Veracruz; at Leon, State of Guanajuato, and possibly at Guadalajara, State of Jalisco.

Cemento Anahuac, S.A., has recently started construction of a two-kiln plant at Cuernavaca, State of Morelos and expects a production of about 200 metric tons daily.

Apart from the above there are a great many paper projects and ru-

mors of projects for cement factories in almost every state in Mexico. Some will be built but a great many will not. In 1937 Mexico produced a total of 344,693 metric tons of cement. In 1938 this increased to 373,712 tons; in 1939, 409,784 tons; in 1940, 484,992 tons; in 1941, 537,464 tons, and in 1942, 588,476 tons. During the year 1943 the total production of somewhat less than 650,000 metric tons of cement will be achieved, which is somewhat less than the 744,600 tons hoped for by the industry. It is much doubted that a yearly production of 1,595,050 (equivalent to 9,261,510 barrels) expected of the industry after present plants complete additions.



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## Cast Stone Convention

(Continued from page 102)

showed slides to illustrate an impressive list of new products that he had compiled. He said that he knew of 24 manufacturers that were making catch basins, 69 making man-hole covers and rings, 13 making septic tanks, 25 making bathtubs and 27 making shower bases. He mentioned that one individual in Wisconsin had manufactured 100,000 concrete lawn rollers, that another concern was making 1000 concrete hog troughs a day and another had made 121,000 concrete sash weights.

Slides were used to illustrate bathtubs, inlet covers and slabs, catch basin covers and frames, catch basin gratings, shower receptor trays, septic tanks, keel blocks, mullions and sills, concrete dies, hog feeding troughs, tractor wheel weights, concrete lawn rollers, burial rough boxes, precast steps, coal boxes, milk cooling tanks, splash block for gutters, stair treads and even a concrete ping pong table in one of the parks at Jackson, Miss. All of the units mentioned are in production.

The bathtubs shown were in production at the rate of 22 a day. The catch basin gratings shown were made by the North Shore Concrete Joist Co., Northfield, Ill., and installed at the Glenview Naval Base. Receptors shown were of two types, a square unit made in Milwaukee, Wis., and the one of bathtub size made by the Badger Concrete Co., Oshkosh, Wis.

Mr. Ruhling believes that septic tanks are a specially good product for postwar manufacture, because when the R.E.A. begins to function the farmers will be installing electricity and plumbing fixtures. He mentioned the septic tank, consisting mainly of two concrete pipes, as manufactured by the Longview Concrete Pipe Co., Longview, Wash.

Keel blocks measuring 1 ft. by 1 ft. by 110 in., manufactured by the Nelson Concrete Stone Co., Braintree,

Mass., were shown on slides; also mullions and sills at the Bell and Howell plant, Chicago, which were made by the North Shore Concrete Joist Co.

The Badger Concrete Co. was the manufacturer of the concrete dies shown and Illinois-Michigan Silo Co., Peoria, Ill., of the hog feeding troughs. Also the small hog feeding unit made by Joe Boyer, Greenfield, Ind., at the rate of 1000 a day and sold to Montgomery Ward and Co. and Sears Roebuck Co., was shown. The lawn roller, produced in New London, Wis., is made in 15- and 16-in. diameters, 22 in. long. The same manufacturer has made concrete Christmas tree stands.

The rough boxes shown were made of six pieces of precast concrete 1 in. in thickness. M. A. Arnold has sold 8,000 coal boxes of the type shown on the slides. A Nebraska manufacturer has sold 200 milk cooling tanks in his first year, according to Mr. Ruhling. They each hold four cans of milk. In conclusion he mentioned a ready-mixed concrete producer who has made 40 tons of stepping stones from the concrete returned in the drums of mixer trucks.

Much interest was shown in subsequent discussion of precast stringers and stair treads and the opinion was that the products have unlimited postwar possibilities. The treads could be of plain concrete or have carborundum, marble or terrazzo wearing surfaces. The manufacturers who have had experience in their manufacture led the discussion. One of them had a model of the stairway he proposes to make and sell at a price of \$10 per foot of vertical rise, which competes favorably with wood construction.

P. M. Woodworth, Paul Formigli, A. R. Krehbiel, Otto Buehner, Austin Crabbs and F. E. Milewski were the scheduled principals in a panel discussion of the manufacture, use and merchandising of precast concrete joists.

M. W. Adams, secretary, Modular Service Association, Boston, Mass.,



Left to right: Harry C. Shields, Marquette Cement Mfg. Co., and Austin Crabbs, Davenport, Iowa, at registration desk

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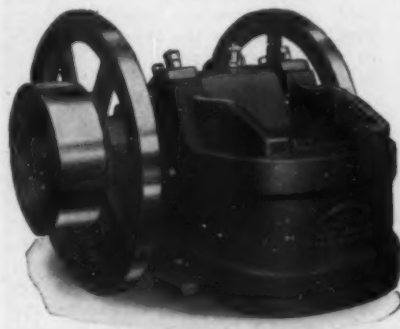
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discussed the proposed standardization of unit sizes for building materials that is being developed (see concrete masonry convention report in this issue) from the standpoint of its effect on the use of cast stone.

The concluding session of the convention was a joint meeting with the National Concrete Masonry Association covering talks on postwar construction and modular planning, which are reported elsewhere in this issue. (See National Concrete Masonry Convention Report.)

### Talc Labor Hazard

FIBROUS TALC, or asbestine, and its ultimate derivative, tremolite, present a definite workers' health hazard, according to the findings of the New York State Department of Labor. After a study of fibrous talc miners and millers and both mine and mill operations, industrial hygiene "experts" reported that "exposure to tremolite talc dust must be considered to constitute a definite industrial hazard requiring control of dust by suitable engineering methods."

More than half of the mined fibrous talc goes to the paint industry where it is used as an extender, although in some types of paint it may be the principal pigment. It is also used in "loading" all grades of paper. Known as "lava" in the ceramics industry, talc meets the special requirements of the electrical and refractory industries.

In the New York Labor Department's study, operations and dust concentrations in three talc mines and five mills were observed and analyzed by engineers. Physicians gave initial x-ray examinations to 221 men from seven plants. Twenty-eight of these men showed positive lung findings. Eighteen showing marked fibrosis had a work history that did not include any dusty industry other than talc. The study showed fibrosis relatively more prevalent among millers than miners. The group showing fibrosis had been exposed to talc dust for at least 10 years and presented an undernourished and drawn appearance.

A complete technical report of the talc hazard study may be obtained from the Labor Publications Editor, Labor Department, State Office Building, Albany 1, N. Y.

### Cement Leader Dies

MONROE C. MONDAY, president and general manager of the Cumberland Portland Cement Co., Cowan, Tenn., died in Knoxville on February 28. Mr. Monday also was president of the Hermitage Portland Cement Co., Nashville, Tenn., which he helped organize 20 years ago and served as one of its first directors. In his earlier years he was in the construction business and later headed the Gray Eagle Marble Company.

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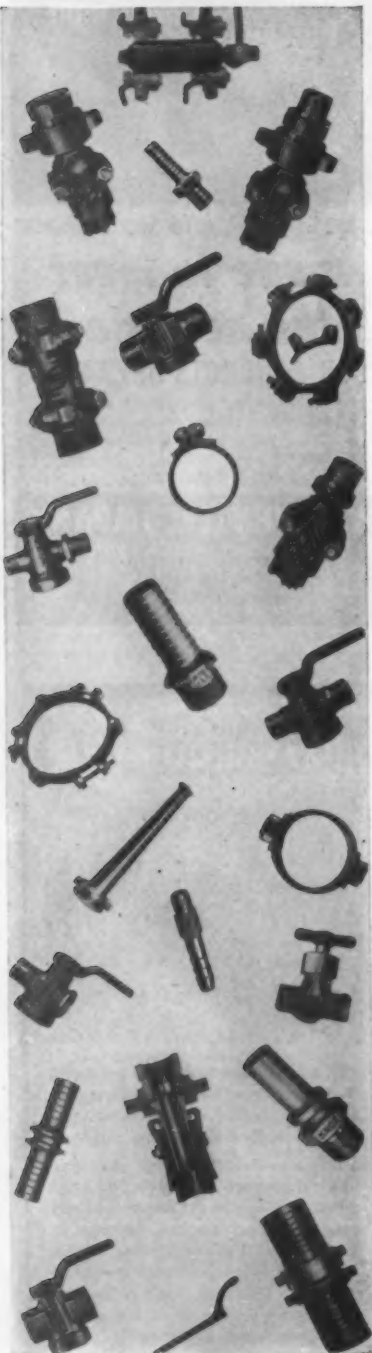
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## Mineral Paint Fillers

Domestic producers supply demands for  
paint fillers formerly obtained by imports

**T**HERE IS A CERTAIN CLASS of pigments which are known as "fillers" or low opacity pigments. Actually these pigments have high opacity when a binder of glue or casein is employed, but when immersed in a film of a drying vegetable oil, their index of refraction is so similar to that of the dried oil film that a translucent and more or less transparent film results. For this reason, they are employed in oil paints not as opaque pigments but as fillers.

The use of such a filler in an interior finish such as a flat wall paint, is perfectly legitimate and desirable. In such a case, its use represents an economy which is passed on to the consumers and they do not expect the wearing qualities of the paint. However, the use of fillers in exterior house paint presents some dangers and the respectable paint manufacturer employs them in judicious quantities.

These fillers include the minerals gypsum, whiting or limestone, silica, barytes, mica and micaceous chalk, magnesium silicate, etc.

At one time the American paint manufacturer imported English whiting, which came from the historic cliffs of Dover. This was available in several grades depending upon the fineness of texture. This limestone was soft and easy to grind, easier, in fact, than our domestic limestone. More recently improved methods of grinding have made it economical and feasible to use domestic limestone.

### New Process for Precipitating Calcium Carbonate

A considerable amount of limestone is worked up into pigments known as "precipitated" whiting. In this process the limestone is powdered and dissolved in water containing carbon dioxide under pressure. The resulting solution of calcium bicarbonate is then treated with an emulsion of hydrated lime to precipitate the original calcium carbonate in the form of a very soft pigment which is rapidly growing in popularity for interior finishes.

Silica occurs as quartz, as amorphous silica, or Tripoli, and as diatomaceous silica.

Quartz is sometimes heated and quenched in water, ground and dried to a rather harsh and coarse white pigment. Its use as such is quite limited.

\*From a paper by K. J. Keating, factory manager, General Paint Co., Tulsa, Okla., read at a meeting of the Oklahoma Mineral Industries Conference.

In Missouri and eastern Oklahoma we have considerable deposits of amorphous silica which may be dry ground or water ground, the latter process being preferable, to form an inexpensive and stable pigment.

### Diatomaceous Earth in Camouflage Paint

Diatomaceous silica consists of the skeletons of minute sea animals, of the sponge type which have been deposited in great depths along the California and Oregon coasts. Suitable deposits may be to very considerable depth and easily worked. This type of silica retains the skeletal formation of the original sea animal. If desired, it may be bleached with sulphuric acid, or other bleaching agents and ground and air separated to form a very soft and fluffy pigment which is used in finishes in which a low degree of gloss is desired. One example of this type of finish is camouflage paint, in which it is desired to have no sheen or gloss which could be noticed by the eye of an enemy airman. The dull, flat, olive drab finish of the army automobiles and trucks is made on a government specification which requires the use of a certain amount of diatomaceous silica.

Magnesium silicate is very popular with the paint manufacturer. If properly ground, this pigment will contain both amorphous and rock shape particles. This latter shape is of particular value in preventing the settling of paint in the package. It also lends some degree of tensile strength to the paint film so that paints containing this filler, or low priced pigment, will not suffer particularly in durability.

We have considerable use for fillers in plastic paints. As you know, many roof paints contain asbestos which greatly improves the tensile strength of the film and prevents the sagging of the paint under the hot sunlight.

### Buying Agstone Spreaders

LOUISIANA LIMESTONE CO., Shreveport, La., with limestone deposits and crushing plant in Bienville parish, has purchased 25 limestone spreaders and plans to add 25 additional trucks to take care of the very large demand for agricultural limestone, according to Horace T. Long, manager of the company. It is planned to increase capacity of the plant to 15,000 tons per month. Introduction of the lime spreader trucks, said Mr. Long, has opened the way for widespread large scale liming of land.



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## Staying Power

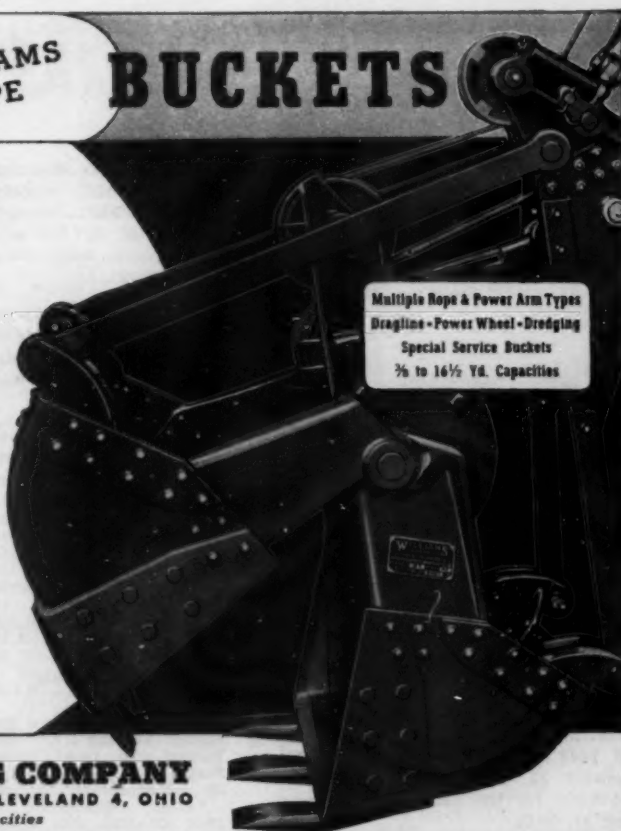
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# FINANCIAL NOTES

## RECENT DIVIDENDS

	Amount	Payable
Alpha Port. Cement Co. \$0.25	Mar. 25	
Basic Refractories . . . . . 10	Mar. 15	
Canada Cement Co., Ltd., 6½% pfd. (p100) (ar- rears) . . . . . 1.25	Mar. 20	
Canada Crush'd Stone Co. .10	Mar. 20	
Consumers Co., pfd. Ac. . . 1.00	Mar. 15	
Industrial Silica Corp., 6½% pfd. (p100) (ar- rears) . . . . . 1.62½	Mar. 10	
Lone Star Cement Corp. Com. (np) . . . . . 37½	Mar. 31	
Ohio River Sand Co., 7% pfd. (arrear) . . . . . 1.75	Mar. 1	
Pennsylvania-Dixie Ce- ment Corp., 87 pfd. A (np) (arrear) . . . . . 50	Mar. 15	
South'n Phosphate Corp. .10	Mar. 31	
U. S. Gypsum Co. . . . . 50	Apr. 1	
U. S. Gypsum Co., 7% pfd. 1.75	Apr. 1	

WOLVERINE PORTLAND CEMENT CO., Coldwater, Mich., reported a net deficit of \$38,910 for the year ended December 31, 1943. This compares with a net profit of \$42,833 in 1942.

SUPERIOR PORTLAND CEMENT, INC., Seattle, Wash., reported net income of \$444,714 for the year ended December 31, 1943, as compared with \$476,631 for the year ended December 31, 1942.

SCHUMACHER WALLBOARD CORP., Los Angeles, Calif., reports for the three months ended January 31, 1944, net income of \$37,915 after all charges and federal taxes but subject to re-negotiation.

SOUTH DAKOTA STATE cement plant reports a profit of \$265,000 for 1943 on sales of 494,755 bbls. of cement, 65 percent of which was for military work.

LAWRENCE PORTLAND CEMENT CO., New York, N. Y., presented the following statement of incomes for the years ended December 31:

	1943	1942
Net sales . . . . .	\$2,430,964	\$3,595,496
Cost of sales . . . . .	2,354,469	3,076,793
Selling, etc., expense . . . . .	354,898	447,349
Operating profit . . . . .	d 278,403	71,354
Other income, net. . . . .	29,257	25,293
Total income . . . . .	d 249,146	96,647
Prior years tax res. cr 76,904		
Prior yrs. tax refd. . . . .	20,000	
Income taxes . . . . .	21,500	
*Net income . . . . .	d 152,241	75,147
Dividends . . . . .	37,500	
Surplus for year. . . . .	d 152,241	37,647
Earned surplus, 1-1 . . . . .	456,906	419,259
Earned surp., 12-31. . . . .	304,685	456,906
Earned per share. . . . .	d \$2.03	\$1.00
No. of shares. . . . .	75,000	75,000
*After depreciation and depletion:		
1943, \$253,926; 1942, \$260,682.		

UNITED STATES GYPSUM CO., Chicago, Ill., presents the following consolidated income account for the years ended December 31, 1943:

	1943	1942
Net sales . . . . .	Not stated	\$62,225,140
Cost of sales . . . . .		\$38,741,535
Selling, etc., exp. . . . .		\$8,320,815
Oper. profit . . . . .	\$12,195,130	15,162,790
Other income . . . . .	444,346	512,470
Total income . . . . .	12,639,476	15,675,260
Deprec. & deplet. . . . .	2,320,922	2,671,512
Income taxes . . . . .	2,508,000	2,521,000
Excess prof. tax. . . . .	2,919,000	5,210,000
Post-war tax cred. cr 306,000		cr 508,000
Legal, etc., exp. . . . .	164,106	128,431
Net income . . . . .	5,038,450	5,652,316
Preferred divs. . . . .	547,554	547,554
Common divs. . . . .	2,393,544	2,392,746
Surplus for year. . . . .	2,097,352	2,712,016
Earn. surp., 1-1. . . . .	30,371,753	26,899,409
Credits . . . . .		\$770,328
Earn. surp., 12-31. . . . .	32,460,105	30,371,753
Times pfd. divs. . . . .	9.20	10.32
Earn. pfd. shares. . . . .	\$64.41	\$72.26
No. of pfd. shares. . . . .	78,222	78,222

From SEC report.  
Proceeds in excess of ledger value of vessels lost at sea.

LONGHORN PORTLAND CEMENT CO., San Antonio, Texas, reported a net income of \$303,604 for the year ended December 31, 1943. This compares with \$524,990 for 1942.

## "PENNSYLVANIA"



### STEELBUILT REVERSIBLE HAMMERMILL

making fine feed for efficient raw grinding, in World's latest Cement Plant.

This is one of a rapidly increasing number of installations in the Cement, Lime, Gypsum and

PUT YOUR REDUCTION PROBLEMS UP TO US!



LIBERTY TRUST BLDG.  
PHILADELPHIA 7, PA.

Process Industries, where alert Operators were quick to take advantage of the economies which REVERSIBLE operation affords,—

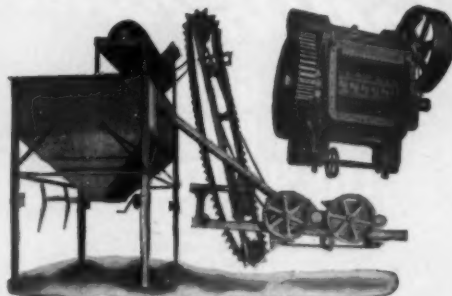
- Major Reduction by Smashing Impact,—
- Automatic Hammer Turning and Resharpening,—
- Adjustment for Product Uniformity and Wear,—

factors which sharply cut over-all costs.

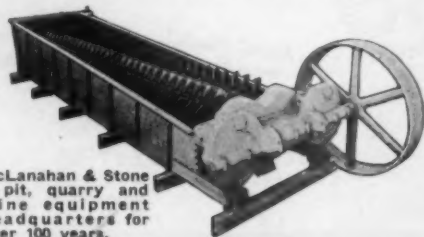
Fifteen (15) sizes to meet all requirements.

## McLANAHAN

SCREENS • CRUSHERS



McLanahan equipment will prepare your plant for more business. Single and double roll and jaw crushers, hammermills, super dry pans—steel log washers and scrubbers, sand drags, revolving and vibrating screens, elevators, conveyors, dryers, jigs, and hoists—complete portable, semi-portable and stationary crushing, screening, and washing plants for different capacities of any material.



McLanahan & Stone  
—pit, quarry and  
mine equipment  
headquarters for  
over 100 years.

COMPLETE PLANTS

McLanahan & Stone Corp.

Established 1835  
HOLLIDAYSBURG,  
PENNSYLVANIA

ROCK PRODUCTS

PENNSYLVANIA-DIXIE CEMENT CORP., New York, N. Y., presented the following consolidated income account for the years ended December 31:

	1943	1942
Net sales .....	\$7,505,210	\$11,808,105
Cost of sales .....	4,220,188	6,040,898
Selling & adm. exp. 1,146,396		1,260,941
Maint. and repairs. 575,191		788,842
Taxes .....	252,788	316,882
*Deprec. & deplet'n 504,961		512,365
Operating profit ...	805,696	2,888,177
Other income, net ..	111,106	38,022
Total income .....	916,802	2,926,199
Interest .....	163,701	204,720
Fed. income taxes. 210,000		449,000
Excess profits tax.. (1)		1,170,000
Other income taxes ..	10,000	40,000
Net profit .....	533,101	1,062,479
Preferred dividends 272,700		363,800
Surplus for year...	260,401	698,679
Earned surplus, 1-1 2,501,230		1,802,351
Earned surp., 12-31 2,761,631		2,501,230
Times int. earned:		
Before income tax ..	5.60	14.29
After income tax ..	4.26	6.19
Times int. and pfd. divs. earned .....	.69	1.20
Times pfd. divs. ....	.63	1.25
Earned, pfd. share. \$4.40		\$8.76
No. of pfd. shares.. 121,200		121,200

\*Excluding additional depreciation charged to special reserve: 1943, \$423,271; 1942, \$447,502.

†Includes reserves no longer required: 1943, \$55,000; 1942, \$20,000.

‡No provision necessary for excess profits taxes. Corporation and a subsidiary company will file claims for refund of a portion of Federal excess profits taxes paid for year 1942, based upon carry-back of unused excess profits credits from year 1943.

NATIONAL GYPSUM COMPANY, Buffalo, N. Y., announced a net profit of \$973,014 for the year ended December 31, 1943, comparing with \$1,048,059 for the year ended December 31, 1942. Net sales in 1943 were \$21,739,687 as against \$22,139,798.

GIANT PORTLAND CEMENT CO., Philadelphia, Penn., showed a net loss of \$17,348 for the year ended December 31, 1943. This compares with a profit of \$43,189 for the year ended December 31, 1942. Net sales in 1943 were \$1,130,198 as against sales of \$1,439,977 in 1942.

MISSOURI PORTLAND CEMENT CO., St. Louis, Mo., showed the following income statement for the years ended December 31:

	1943	1942
Net sales .....	\$4,339,163	\$5,828,522
Cost of sales .....	3,048,322	3,825,883
Selling, etc., exp. 504,248		591,258
Deprec. & deplet. 438,978		462,684
Operating profit...	347,615	948,698
Other income, net ..	18,791	dr 55,881
Total income .....	366,406	892,817
Income taxes .....	153,134	358,664
Net income .....	213,273	534,153
Dividends .....	211,805	353,008
Surplus for year...	1,468	181,145
Earn. surplus, 1-1. 1,163,793		982,647
Earn. surpl., 12-31 1,165,261		1,163,793
Earned per share. \$0.76		\$1.89
Number of shares. 282,406		282,406

†No provision deemed necessary for excess profits tax.

## INTRODUCTORY \$10.00 PACKAGE

For welding of 11 to 14% Manganese steel

Gyratory, Roll, Jaw Crushers, Dipper Teeth, Pump Shells, Impellers and all Equipment that wears due to impact and abrasion.

### Contents

Manganese Special Tite-Kote Welding Electrodes

5 lbs. 1/4" x 18"  
10 lbs. 3/16" x 18"  
5 lbs. 5/32" x 18"  
for  
A.C. & D.C.

Seven  
Hard Facing Electrodes  
5 lbs., 3/16" x 12"  
for  
A.C. & D.C.



\$13.67 Worth for \$10.00. Only one box to a customer.

Our Distributors can make immediate shipment.

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**STULZ-SICKLES CO.**

Newark 5, N. J.

☐ Have your nearest Distributor ship us, (1) only, \$10.00 Introductory Package.

☐ Mail us Direct, one FREE copy of your New Booklet, "The Welding of 11 to 14% Manganese Steels."

Name .....  
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City .....  
State .....

We Own and Offer

## NEW & USED EQUIPMENT

### SPECIAL

DIESEL GENERATING UNIT—Fairbanks-Morse 6 cylinder "YVA" 300 H.P.—250 KVA.  
TURBINE GENERATOR—Westinghouse 1000 KW—250 V.—D.C.  
ROTARY CONVERTER—1000 KW Westinghouse, Transformer and auxiliaries.  
TURBINE—100 HP. Westinghouse 2700 RPM gear reduction.  
AIR COMPRESSOR—I. R. Duplex, 100 HP. motor and receiver.  
STEEL GUY DERRICK—110' mast 90' boom—3 drum Clyde hoist, electric.

### DREDGES, TUGS & SCOWS

1—DREDGE, steam, steel hull, bucket type.  
1—TUG, steam, steel hull.  
3—SCOWS, steel.  
1—MACHINE BOAT, steel, marl cutter.

### GRINDING EQUIPMENT

1—CRUSHER, Kennedy No. 14 Gyratory.  
1—PUG MILL, 15" diameter x 8 1/2' with heaters.  
1—TUBE MILL, 5 1/2' x 29', F. L. Smith Co.  
1—TUBE MILL, 5 1/2' x 32'.  
2—RAYMOND MILLS, 4 rolls.

### SCREENS

4—SINGLE DECK HUMMER SCREENS, 4'x5' complete with feeder and generator.  
2—SINGLE DECK HUMMER SCREENS, 4'x5'.  
1—TRIPLE DECK KENNEDY SCREEN.

### BELT CONVEYORS

1—CONVEYOR, 120' x 24", ball-bearing rollers and idlers, complete with belt, like new.

### MISCELLANEOUS

1—WAGON DRILL, Gardner-Denver.

### SYNCHRONOUS MOTORS

1—1900 HP., 25 cycle, 2300 V.  
2—1250 HP., 25 cycle, 2300 V.

### AGITATORS

23—For 12' x 12' tanks, and others.

### DRYERS

1—3 1/2' x 44 ft. and others.  
1—7' x 56' Rotary Coal Dryer.

### FEEDERS

2—BAILEY FEEDERS, Type No. 2, complete with steel hoppers, 8 1/2' dia. x 12 ft. cone bottom.

### KILNS & COOLERS

Vulcan 7' x 120', like new. Also various others.

### CRANES

1—LOCOMOTIVE, 4-wheel, 10 ton, 35' boom, Brown Hoisting Co.  
1—OVERHEAD, 10 ton, 74' span, air operated.

WANTED: DIESEL AND GENERATING EQUIPMENT

**WEBBER EQUIPMENT CO.**

New and Used Equipment

17 East 45th St., MU. 2-6511, New York 17, N. Y.



# CASE EVIDENCE

That Will Help You  
Decide Whether You Can

*Profit by  
Installing  
a*

**JOHNSON  
BULK  
CEMENT  
PLANT**



• The Johnson Bulk Cement Plant is engineered and built to eliminate the extra expense and double labor of handling large quantities of cement in bags. With this plant, carload shipments of bulk cement are handled at savings that, in many cases, cover the full cost of the equipment and installation in one year.

Here's a typical example: A mid-western Central Mixing Plant, consuming 15,000 barrels of cement a year, is installing a Johnson Bulk Cement Plant. Savings through buying in bulk instead of in bags, 5 cents per bbl. Savings on the cost of moving bags from car to warehouse were estimated to run from 5 cents to 6 cents per bbl. A further saving of 4½ cents results from the elimination of labor incident to opening bags and handling in the mixing plant. Total savings through the use of bulk cement were estimated by the operator at \$2325.00 for one year's operation.

In addition, this operator estimates that the accurate and uniform weighing, made possible by the Johnson Batcher, eliminated waste caused by a split-bag specification . . . saving the cost of an additional 400 bbls. annually.

With this practical example as a basis, make your own calculation in terms of your annual volume . . . and decide for yourself whether and how much you can profit by installing a Johnson Bulk Plant.

Write for Data on Johnson's  
ELEVATORS • CLAMSHELL BUCKETS  
CEMENT STORAGE SILOS • BATCHERS

the C. S. JOHNSON COMPANY  
Champaign • Illinois

## OBITUARIES

HENRY DOLESE, co-founder and former president of Dolese Brothers Co., now Dolese & Shepard Co., Chicago, Ill., dealers in crushed stone, died February 8 in Oklahoma City, Okla. He was 74 years old.

BENJAMIN FRANKLIN AFFLECK, former president of the Universal Atlas Cement Co., Chicago, Ill., from which he retired in 1936, died suddenly on February 13 in the family home at Winnetka, Ill. Mr. Affleck was born in Belleville, Ill., and started his career there with the Harrison Machine Works. He was later employed by the St. Louis, Alton & Terre Haute Railroad and the Illinois Steel Co., now the Carnegie-Illinois Steel Corp. In 1901 he was made branch manager of the company's cement department in St. Louis. When, five years later, this department became the Univer-



Benjamin Franklin Affleck, to the left, with E. W. Dienhart at a recent convention

sal Portland Cement Co., a subsidiary of the U. S. Steel Corp., he was elevated to the position of general sales manager in Chicago where he developed an outstanding sales organization.

In 1915 Mr. Affleck was elected president of the Universal Portland

Cement Co. When it joined with The Atlas Portland Cement Co. in 1930, to become the Universal Atlas Cement Co., he continued as president until his retirement in 1936, but remained as a director until his death. Mr. Affleck was active in civic affairs in Chicago and had served as president of the Citizens Association, Union League Club, Engineers' Club, and the Executives' Club. He was an honorary member of the Portland Cement Association, of which he was president for five years.

WILLIS H. LOOMIS, organizer and president of the W. H. Loomis Talc Corp., Gouverneur, N. Y., died recently at the age of 73. Born in Paine's Hollow, Herkimer County, N. Y., Mr. Loomis, after graduating from Cornell University, started his career as a draftsman for the borough of Brooklyn. He was later employed by the Erie Railroad and the D. L. & W. Railroad. In 1908 he was made manager of the anthracite mines of the G. B. Markle Co., and three years later became president of the Rock Hill Mining Co. He was president of the W. H. Loomis Contracting Co. from 1912 to 1917.

In 1918 Mr. Loomis organized the W. H. Loomis Talc Corp. and purchased the Arnold Mine, constructing the first mill at Emeryville. He conceived the idea of a much finer product to reduce production costs for manufacturers and also the idea of double air flotation for greater fineness and uniformity. Many valuable mineral rights were acquired in southern St. Lawrence County.

Mr. Loomis had served as president of the W. H. Loomis Talc Corp. since 1918, and of the St. Lawrence Ore Co. since 1920. He was a director of the Green Hill Mining Co., and had served as vice-president of the Watertown Milling Co. for five years.

JOHN HAAS, plant manager of Minnesota Mining & Manufacturing Co., Wausau, Wis., died recently at the age of 47. He had been manager of the plant in charge of rock crushing and colored roofing granules manu-

## THE ROSS FEEDER

Completely controls the flow of any size material from Storage Bins, Hoppers or Open-Dump Chutes to Crushers, Conveyors, Screens, etc.

High in efficiency. Low in maintenance and power consumption.

Furnished in sizes to suit your operation. Send full particulars for recommendation.

**ROSS SCREEN & FEEDER CO.**

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NEW YORK, U. S. A.

11 Walpole Road  
SURREY, ENGLAND

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facturing since 1934. Prior to that he was with Traylor Engineering & Manufacturing Co., Allentown, Penn.

**WILLIAM EVANS DILLARD**, former Eastern division sales manager for United States Gypsum Co., Chicago, Ill., died February 16 in Lynchburg, Va. He was 51 years old and had retired several years ago.

**MELVIN V. PATTISON**, chairman of the board of directors of the Industrial Brownhoist Corp., Saginaw, Mich., died February 11 at his home in Bay City, Mich., at the age of 79. Mr. Pattison was born in Hudson, Mich., in 1864, and entered the employ of the Brown Hoisting Machinery Co. of Cleveland, Ohio, as a salesman in 1901. He later served as sales manager and finally as vice-president and general manager. When this company merged with the Industrial Works of Bay City, Mich., in 1937, Mr. Pattison became vice-president and general manager of the new corporation. He assumed the presidency in 1934 and became chairman of the board in April, 1939.

**SGT. ALFRED D. WARNER, III**, son of A. D. Warner, Jr., vice-president and treasurer of The Warner Co., died in North Africa from an illness contracted in service with the Army Air Forces. Sgt. Warner had worked at the Bellefonte Division of the company before he left for training.

**ALLAN E. HALL**, manager of the milling machinery department of Allis-Chalmers Mfg. Co., Milwaukee, Wis., passed away recently at the age of 70. He had been with the company for about 35 years.

**WILLIAM M. BYRD, JR.**, president of the Alabama Pipe Co., Anniston, Ala., died recently at the age of 69.

**FREDERICK JOSEPH PECK**, vice-president of the Scranton Slag Co., Inc., Scranton, Penn., died recently after a short illness. He was 79 years of age.

## N. C. Leading in Mica

STATISTICS recently published by W.P.B. show that North Carolina, leading producer, supplied 50 percent of the \$3,200,000 worth of mica output in 1943, compared with 75 percent of the \$300,000 value of the 1937 production. In 1943 New Hampshire was second with approximately \$500,000 in value; South Dakota, third, with \$440,000; Georgia, fourth, with \$170,000, and Connecticut, fifth. Six other states produced substantial quantities in 1943, as follows: Alabama, Idaho, Massachusetts, Maine, New Mexico and Virginia. Small quantities came from Colorado, Montana, Nevada, Pennsylvania, South Carolina, Texas and Wyoming.

**PULVERIZERS** for the reduction of Cement Materials, Limestone, Agricultural Limestone, Fire Clay and All Dry, Refractory Materials.

Capacities: 1 to 60 tons per hour

Finenesses: 20 to 350 mesh

## BRADLEY PULVERIZER CO.


ALLENTOWN, PENNA.

To Increase Capacities or Fineness of Present Grinding Plant—  
To Reduce Power and Maintenance Costs—  
To Insure an Absolutely Uniform Product—

Use the **BRADLEY AIR SEPARATOR**

Record  
Tonnages in  
Screening Rock,  
Gravel & Ores  
Throughout  
the World

**TY-ROCK**



**SCREEN**

Full Floating  
Circle-Throw  
Action  
for  
Coarse and  
Medium  
Sizes

Write for  
Catalog No. 65

THE  
W. S. TYLER COMPANY  
CLEVELAND, OHIO

## Alpha products

Screw Conveyors Any Size and Gauge.  
Welded Elevator Buckets All Sizes. Storage Bins, Bin Gates Special Designs. Tanks, Pressure and Storage, Plate and Sheet Metal Specialties of Steel, Copper, Stainless Steel, and Aluminum.



Serving Industry Since 1878

**Alpha Tank & Sheet Metal Mfg. Co.**  
3001 South 38th Street St. Louis 16, Mo.



## ERIE THE COMPLETE LINE BUCKETS

Hundreds of Erie Buckets are being shipped monthly for war uses. Straight line bucket production experi-



ence means better buckets for post-war and fast delivery. Investigate the complete Erie line now.

**ERIE STEEL CONSTRUCTION CO. • ERIE, PA.**  
*Aggregators • Buckets • Concrete Plants • Traveling Cranes*

## Sand-Lime Brick Convention

**H**IGH PRESSURE steam curing in all its aspects was discussed in a meeting of the National Sand-Lime Brick Association held at the Sher-

RALPH CROMIS, Boice Builders Supply Co., Pontiac, Mich., was elected president, and Leo Ryan, Ryan Fuel and Supply Co., Windsor, Ont., Can-



J. Morley Zander, secretary-treasurer, National Sand-Lime Brick Association, left, and Ralph Cromis, newly-elected president

man Hotel, Chicago, on February 14. The meeting was called principally to develop standards for high pressure steam curing, through open forum discussions of practices followed, and to elect officers for 1944.

ada, was elected vice-president. J. Morley Zander, Saginaw Brick Co., Saginaw, Mich., was re-elected secretary-treasurer and Elmer Coates, Mutual Materials Co., Spokane, Wash., was re-elected West Coast

executive secretary of the association.

The discussion centered around the activities of A.C.I. Committee 716, on which several members are active in the preparation of a report on high pressure steam curing for the American Concrete Institute, and the use of the definition of high pressure steam curing, as it will be established in that report, to set up qualifications for membership into the Association.

M. W. Ferguson, Roanoke, Va., manufacturer of high pressure steam-cured cinder block, of Roanoke, Va., a member of committee 716, emphasized that in the definition to be set up that it be based upon performance of the units in the wall. He stated that a definite maximum shrinkage should be guaranteed to the customer, that could be set as low as 0.33 in. per 100 lineal feet of wall, if high pressure steam-curing was done properly. He stressed that the customer does not care how the units are cured provided they come within the guaranteed limits of shrinkage as established and, therefore, no standards of temperature or pressure in the curing kilns or length of curing period need be set.

In his own plant, Mr. Ferguson said that he was curing concrete units in a two-hour shorter period than others require and was consistently producing units with lower shrinkage in the wall than the limit he suggested for the basis of a definition. Mr. Ferguson uses 200-mesh silica in his mix.



● Securing economical distribution and compact plant design, this Barber-Greene system of conveyors was worked out to screen into three sizes. Outstanding is the fact that the three B-G stockpiling conveyors are supported out of the pile by B-G steel A-frame supports, greatly aiding reclamation operations.

● The reciprocating feeder, four belt conveyors, and A-frames are all B-G standard pre-engineered units, selected for this construction. Our engineers can help you with your material handling problems.

Q-25

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AURORA ILLINOIS

**ROLLS ROYCE**

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No. 1586—Blaw-Knox Concrete Buckets.  
No. 1606—Blaw-Knox Buckets for Contractors.

No. 1696—Blaw-Knox Buckets for Single Drum Hoists for use on Railroads, Mills, Foundries, Etc.

No. 1745—Blaw-Knox Buckets for

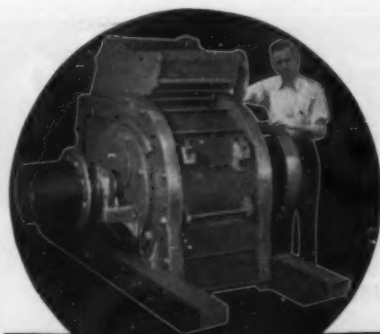
"Burtoring" handling Nitrates, Grain, Potash, Etc.

No. 1757—Blaw-Knox 2 Line Lever Arm Buckets for Rehandling, Barge Cleanup, General Purpose, Hard Digging, Dredging.

No. 1865—Blaw-Knox 4 Rope Buckets for Coal, Ore and Cleanup.

### BLAW-KNOX DIVISION of Blaw-Knox Company

2035 Farmers' Bank Bldg., Pittsburgh, Pa.

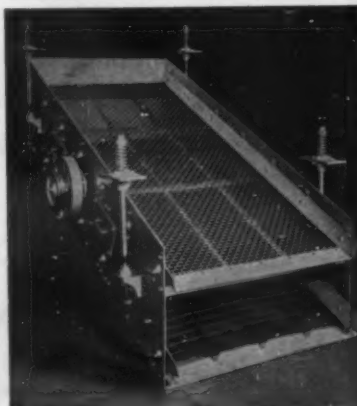


You can do more in a "DAY"

### Swing Hammer PULVERIZER

Its wide crushing range makes it serve the purpose of two or more other types of crushers. Roller bearing equipped. Write for Bulletin.

**Brooks** EQUIPMENT & MFG. CO.  
KNOXVILLE, TENNESSEE



### Denver - Dillon Vibrating Screen

The Denver-Dillon Vibrating Screen has been proved by over four years of service in numerous industries. Operators report definite reduction in screening costs. "Floating circle" principle requires less than half of the average power of other means of screening. Write today for new Bulletin No. 83-B3.

Denver Equipment Co.  
1400 Seventeenth St.  
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Mexico, D. F., Edificio Jalisco



### "HIGH DUMP"

Millions of yards of Jaeger Truck-Mixed Concrete on major war work (exceeding the output of all other makes combined) prove the advantages of these motorized concrete plants. Nimble, flexible and fast, they speed placement, solve problem of extended or continuous pours.

THE JAEGER MACHINE CO.,  
803 Dublin Avenue  
Columbus, Ohio

Mixers—Pumps—Hoists  
Paving Equipment

or "LOW CHARGE" type



## CEMENT SECURITIES

We are interested in buying and selling securities of the following companies:

Coplay Cement Mfg. Co.  
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Hercules Cement Co.  
Keystone Portland Cement Co.  
Longhorn Portland Cement Co.  
Monolith Portland Cement Co.  
North American Cement Corp.  
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Signal Mountain Portland Cement Co.  
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Specialists in Securities of Cement Companies. Markets for securities of practically all cement companies regardless of inactivity.

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## Manufacturers' News

Allis-Chalmers Mfg. Co., Milwaukee, has set up a new Basic Industries Department which comprises the crushing, cement and mining machinery division, flour milling and oil extraction division, and saw and pulp mill division. Walter Maxon has been appointed manager of the new department. He was formerly manager of crushing, cement and mining department. A separate Texrope Department has also been established of which T. C. Knudsen has been named manager and chief engineer.



Walter Maxon

Bailey Meter Co., Cleveland, Ohio, announces the appointment of N. M. Barnett as manager of the Chicago branch office, succeeding M. Greenberg, who has resigned. Mr. Barnett is a mechanical engineering graduate of the University of Kentucky and has been connected with the Bailey Meter Co. for over 20 years. The vacancy created by Mr. Barnett's transfer to Chicago has been filled by Ralph T. Cowan, formerly of the Detroit and Cleveland sales offices.

Vulcan Iron Works, Wilkes-Barre, Penn., has announced the appointment of Joseph P. O'Brien as assistant to the president of the company. Mr. O'Brien, who started as an apprentice in the Vulcan shops more than 30 years ago, will

have charge of all matters relating to operation and production.

The Elghmy Equipment Co., Rockford, Ill., distributors of construction, industrial and material handling equipment, has moved its sales office to 225 Sixth St., Rochelle, Ill. The Elghmy company represents the following firms: Link-Belt Speeder Corp., Universal Engineering Corp., Chain Belt Co., Davey Compressor Co., Cleveland Rock Drill Co., Wellman Engineering Co., DeSoto Foundry Co., J. E. Ingram Co. and others.

McCabe Powers Auto Body Co., St. Louis, Mo., has been awarded the Army-Navy "E" pennant for high achievement in the production of vitally needed war material. The presentation was made by Col. Malcolm Elliott to Edward J. Powers, Jr., and John J. Powers, vice-presidents of the company. "E" pins for the employees were presented by Lieut. Comdr. P. L. Burgess.

Chicago Pneumatic Tool Co., New York, N. Y., has appointed George B. Doner as sales manager of the rock drill division, with headquarters at the executive offices in New York. Mr. Doner was formerly branch manager of the Canadian Pneumatic Tool Co., a subsidiary company with offices at Montreal, Canada.

The McCarty Co., Los Angeles, Calif., estimated to be the oldest and largest industrial advertising agency west of Chicago, Ill., recently celebrated its Silver Anniversary. Founded in 1919 by T. T. McCarty, the agency after 25 years is still serving many of its original clients.

The United States Asbestos Division of Raybestos-Manhattan, Inc., Manheim, Penn., has been awarded the Army-Navy "E" pennant for excellence in the production of war equipment. Presentation ceremonies were held at the Grey-Rock plant in Manheim.

LaPlant-Choate Mfg. Co., Inc., Cedar Rapids, Iowa, announces that H. H.

Buchanan has been appointed general sales manager of the company, succeeding H. N. Graves, who resigned last June. Mr. Buchanan was formerly assistant general sales manager and acting export manager for the Thew Shovel Co., Lorain, Ohio.

Western Precipitation Corp., Los Angeles, Calif., announces that E. Calvert Haws, who is engaged in advertising and sales promotional work for the company, has been elected president of the Los Angeles Chapter of the National Industrial Advertisers Association.

U. S. Rubber Co., New York, N. Y., announces that W. S. Long, formerly operations manager at the Los Angeles plant, has been appointed Pacific Coast sales manager, mechanical goods, and will continue in charge of War Products activities on the Pacific Coast. J. M. Miller will continue as factory manager of the Los Angeles plant.

Allis-Chalmers Mfg. Co., Milwaukee, Wis., has announced the appointment of A. D. Robertson as assistant manager of the motor division at its Norwood works, Norwood, Ohio. Mr. Robertson was transferred from the company's electrical department in Milwaukee, where he had been in charge of the marine section. Prior to this, he served as a sales engineer in the Washington, D. C., office.

American Chain & Cable Co., Inc., Bridgeport, Conn., has appointed Alton Parker Hall as assistant general manager of sales, with headquarters at 230 Park Ave., New York, N. Y.

SKF Industries, Inc., Philadelphia, Penn., announces the appointment of Walter C. Ahlers to the position of Detroit district manager to succeed Robert H. Hirsch, who has resigned. Mr. Ahlers has held the position of assistant district manager of the Detroit office for a number of years.

The B. F. Goodrich Co., Akron, Ohio, has announced the following appoint-



### FOR WELDING NEEDS

We have the following types of Welding Wire for electric arc welding in stock:

- STAINLESS STEEL ELECTRODES
- HARD-SURFACING ELECTRODES
- MILD CARBON ELECTRODES

We offer quick delivery on Welding Machines, Protect-O-Metal for elimination of weld spatter and Havens "C" Protected Clamps. Your inquiries and orders will receive prompt, courteous attention. Phone, write or wire the warehouse nearest you.



**UNITED STATES STEEL SUPPLY COMPANY**  
CHICAGO (90) • BALTIMORE (3) • BOSTON (34)  
CLEVELAND (14) • MILWAUKEE (1) • NEWARK (1), N. J.  
PITTSBURGH (12) • ST. LOUIS (3) • TWIN CITY-St. Paul (4)

# INDUSTRIAL So-Lo REPAIRS RUBBER

## PROLONGS LIFE OF CONVEYOR BELTS ... RESURFACES PULLEYS ... PATCHES RUBBER BOOTS, GLOVES, ETC.



"Rock Products"

Leading industries use INDUSTRIAL So-Lo. Quickly and efficiently patches and resurfaces breaks, repairs rips, burnt, and worn spots, and fills holes in industrial belting. Increases belt life and assures "lower belt cost per mile." Used on all belts—rubber, rubber composition, leather, textile. Conserves war-vital materials!

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Wide range of other uses. Resurfaces pulleys—metal, wood, composition. Repairs rubber boots and gloves. Makes metal or concrete stair treads slip-proof, lessening accidents. Also effective for insulating switch handles, foot grips, and other electrical devices.

### JUST SPREAD ON— DRIES TOUGH OVERNIGHT

Easy to use. No special tools. Just spread it on to desired thickness—overnight it "air vulcanizes." Waterproof—acidproof—oil and grease resistant. Dries smooth and flexible—tough as rubber.

For full details, write AT ONCE to Dept. G3.

**So-Lo Works, Inc.**  
LOVELAND, OHIO

ments in the newly created chemical division of the company; William I. Burt, general manager of plants; Dr. Frank K. Schoenfeld, director, technical and development; Dr. Victor E. Wellman, director of purchases, and Harry E. Foster, general auditor.

Vulcan Iron Works, Wilkes-Barre, Penn., has appointed Howard G. Jones as their New York representative, with headquarters at 50 Church St. He will have full charge of the New York office, succeeding Thomas MacLachlan who recently resigned to accept a position with another company.

The Dorr Co., New York, N. Y., has announced the resignation of D. S. McAfee as vice-president and a director of the company.

Mr. McAfee has for several years specialized in equipment and methods for the process industries—metallurgical, chemical, industrial and sanitary engineering. He has directed work for and traveled in the United States, Canada, Mexico, Chile, Peru, Brazil, Argentina, Paraguay, Uruguay, England, France, Germany, Holland, Belgium, Philippines, Japan, parts of China and Manchukuo.

Robins Conveyors, Inc., Passaic, N. J., recently presented to W. P. Newman, purchasing agent, a Gruen wrist watch in commemoration of his 45 years of service with the company. The presen-



D. S. McAfee

tation was made by Thomas Robins, chairman of the board, at a luncheon held in the Passaic City Club. Thomas Matchett, president of Robins, acted as Toastmaster. Present at the gathering were 16 people who had spent a total of 400 years with Robins Conveyors. Besides Mr. Newman, those who had seen 30 or more years of service were, in order of precedence: Thomas Robins (53 years), W. R. Browne (39 years), E. S. Stadelman (36 years), E. C. Salzman, R. W. Eichenberger and T. M. Keith (34 years each) and Thomas Matchett (31 years).

Vulcan Iron Works, Wilkes-Barre, Penn., has appointed Ralph O. Smith as general sales manager of the company. Mr. Smith, who was formerly in charge of mining machinery sales, has been with the company since 1918. He is the son of the late F. O. Smith, former vice-president, and grandson of the late Frederick G. Smith, who was treasurer of the company for many years.

LaPlant-Choute Mfg. Co., Inc., Cedar Rapids, Iowa, announces the opening of a sales office in the International Building, Rockefeller Center, New York, N. Y. The new office will be in charge of Jay Fetters, formerly London manager of Caterpillar Tractor Co.

American Chain & Cable Co., Inc., Bridgeport, Conn., has been awarded the Army-Navy "E" pennant for excellence in the production of war equipment at the plant of the Hazard Wire Rope and American Cable divisions. "E" pins were also presented to the employees.

ARUNDEL CORPORATION, Baltimore, Md., had a net income of \$776,543 for the year ended December 31, 1943, as against \$1,271,796 for the year ended December 31, 1942.



The Service Record of this wire rope continues to make and hold friends.

MADE ONLY BY  
A. LESCHEN & SONS ROPE CO.

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### PLYMOUTH LOCOMOTIVE WORKS

Division of The Fiske-Roth-Heath Co. • PLYMOUTH, OHIO, U. S. A.



## WILFLEY centrifugal SAND PUMPS



for Slurries, Sand Tailings, Slimes, Acid Sludges

Save Pumping Cost

Continuous operation without attention for long periods. Stuffing box, stuffing gland water ALL eliminated. Close clearances maintained by easy slippage seal adjustment. Heavy

pumping parts of material best suited for YOUR particular problem. Complete engineering service. Prompt shipment of parts. The most efficient and economical pump you can buy. Write for Complete Catalog

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# Classified Advertisements

## EQUIPMENT FOR SALE

at Chilean Trading Corporation,  
New Village, N. J. (Seven miles  
from Phillipsburg, N. J.)



- 4—7' x 24' Allis-Chalmers Compeb Mills
- 1—6' x 22' Allis-Chalmers Compeb Mill
- 2—6' x 64' Vulcan Stone Dryers with Terry Speed Reducer
- 1—Complete Buell Dust Collecting System with 6—3'-6" diameter Hoppers, Tees, Elbows, Connecting Flues, etc., for 600 H.P. Waste Heat Boiler
- 1—6250 KVA Westinghouse Turbo-Generator complete with Condenser, Circulating Pumps, Air Washer, Oil Filters, Exciters, Switchboard, etc.
- 1—Sly Dust Collecting System with Blower, Cyclones, Valves, Collecting Screw, etc.
- 6—Sets of Hummer Electric Vibrating screens complete with necessary Generators
- 1—Nazareth Fabricators Continuous Bag Cleaning Wheel
- 1—4" Fuller-Kinyon Pump
- 1—8" Fuller-Kinyon Pump
- 1—10" Fuller-Kinyon Pump
- 2—6" Well Drills
- 1—15-ton Clyde Stiff Legged Derrick, complete with Hoist and Swinging Engine
- 3—50-ton American Steam Locomotives
- 1—17-ton Vulcan Steam Locomotive
- 1—17-ton American Steam Locomotive
- 1—8-ton Vulcan Gasoline Locomotive
- 1—Browning Locomotive Crane—Standard Gauge—with 1 Yd. Clam-Shell Bucket
- 1—20-ton General Electric Locomotive—600 Volt
- Elevators
- Drag Chains
- Blowers
- Screw Conveyors
- Fuller Coal Feed Screws
- Speed Reducers—Various Sizes
- Bins
- Platform Scales
- Bag Sewing Machines
- International Filter Company Water Softener.
- 2—Westinghouse Underfeed Stokers for 750 H.P. Boilers
- Miscellaneous Laboratory Equipment, etc.
- Miscellaneous Valves and Piping
- Structural Steel, etc.
- Miscellaneous Machine Shop Equipment

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**RECONDITIONED  
WHEELBARROWS**  
RUBBER TIRED WHEELS  
AND  
STEEL WHEELS  
Also Quantity of  
**WHEELS, TIRES AND TUBES**

Write for Illustrated Price List

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COMPANY**

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Two very large deposits: one filter, one filler grades; one Bentonite property, one large Volcanic tuff or tufa suitable for building material. Am owner, will sell or lease any part to responsible party, long time, low royalty basis.

Address Box 816, Ontario, Ore.

Insley ½ yd. gas shovel on cats.  
LaDel 42"x72" double deck vibrat-  
ing screen with motor.  
Immediate delivery; attractive  
price.

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Warehouse: Carnegie, Pa.

## DESIRABLE EQUIPMENT! FOR IMMEDIATE SHIPMENT!

### JAW CRUSHER

1—36"x48" Allis-Chalmers.

### GRYATRY REDUCTION CRUSHERS

1—3 ½" Symons, coarse bowl.  
1—Kennedy "49" with motor in pulley.

### AIR COMPRESSORS

1—12"x10" Ingersoll-Rand ER-1, with 50 HP, 3/60/220 v. motor, receiver, etc. 355 CFM, 100 lb. pressure.  
1—315-A Ingersoll-Rand Portable Air Compressor, 2-stage, 100 lb. pressure, Hasselman oil engine drive. Rebuilt.  
1—4000 CFM Nordberg, driven by 750 HP Diesel Engine, 100 lb. pressure.

### BELT CONVEYORS

24" x 125'  
24" x 150'  
14" x 32'

### CRUSHING ROLLS

1—Set 36"x16" Sturtevant.  
2—40"x16" Colorado Iron Works.  
1—42"x16" Allis-Chalmers.

### VIBRATING SCREENS

9—Tyler Hummers; 3'x5', 4'x5', one and two-deck.  
1—4'x6" Kennedy, double deck.  
1—3'x6" Niagara.  
1—2'x8" Telamith.

### ROTARY KILNS

2—8'x135', 8'x125'.  
1—7' and 8'x80' Traylor.  
3—5'6" x 7'x80' Vulcan and Reeves.  
1—5'x50' Vulcan.

### DIRECT HEAT ROTARY DRYERS

8—4'x30', 5'6"x24', 5x30', 5x40', 6x50'.

### SPECIAL

3—70" x 30" Ruggles-Coles Type A-9 double shell Direct Heat Rotary Dryers.

### BALL AND TUBE MILLS

3—Hardinge Conical Mills.  
1—5'x22" iron lined.  
2—6'x48" silix lined.



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15-16-17 PARK ROW

NEW YORK, N. Y.

Shops and Yard at Newark, N. J., cover eight acres.

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## POWER SHOVELS • CRANES • DRAGLINES and OTHER EARTH MOVERS

A Wide Selection for You!

Pick the Machine to Fit Your Job!

### LARGE DUMP TRUCKS

We can offer you an excellent assortment in dump trucks. Complete information will be sent to you with prints or photographs upon request.

**AIR COMPRESSORS • MIXERS • CRUSHERS • COMPRESSORS  
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BULLDOZERS • GRADERS • TRUCKS • DUMP TRUCKS  
SHOVEL FRONTS • CRANE BOOMS • BACKHOES**

★★

Through our nation-wide connections we can fill your needs—a complete plant, or the individual piece of equipment you have been looking for.

Or, if you have any idle machinery, or a complete plant you wish to liquidate, get in touch with us—write, wire or phone.

### BUCKETS

#### SELECTION OF 220 BUCKETS

Clamshell, Rehandling, Digging, Dragline, Grange  
Peel, in sizes of  $\frac{1}{2}$ — $\frac{3}{4}$ —1—1 $\frac{1}{2}$ —2—3—5—yards

### POWER UNITS

22 truck mounted power plants  
Sizes from 12 KW up to 75 KW  
Standard generators—standard engines and standard trucks  
Contact us for further information  
We also have gas and diesel engines, power units and stationary generating sets

### SHOVELS AND DRAGLINES

One— $\frac{3}{4}$  yd Bucyrus Erie Model 10B shovel  
One— $\frac{3}{4}$  yd Hanson shovel in good condition  
One— $\frac{3}{4}$  yd Bay City shovel— $\frac{3}{4}$  swing  
One— $\frac{3}{4}$  yd Bay City Shovel Model B  
One— $\frac{3}{4}$  yd Bucyrus Erie swing crawler crane  
One— $\frac{3}{4}$  yd Byers Gasoline Crawler Crane—25' boom—also has skimmer scoop and backhoe attachment— $\frac{3}{4}$  swing  
One— $\frac{3}{4}$  yd Bucyrus—35' boom—no bucket  
One— $\frac{3}{4}$  yd Universal Shovel— $\frac{3}{4}$  swing—has many new parts  
One—Insley  $\frac{3}{4}$  yd shovel  
One—Linkbelt Spender— $\frac{3}{4}$  yd capacity  
One— $\frac{1}{2}$  yd Northwest No. 2 shovel  
One—Bay City 25— $\frac{1}{2}$  yd shovel 1938 model  
One— $\frac{1}{2}$  yd Bucyrus-Erie gas shovel  
Two—General—one backhoe and the other dragline— $\frac{1}{2}$  yd capacity—great bargains  
One—Lorain 30—1937— $\frac{1}{2}$  yd shovel, crane and backhoe combination  
One— $\frac{1}{2}$  yd P & H diesel shovel  
One—Rebuilt Keckring 301 and one rebuilt 302 shovel, crane and backhoe  
One—1 yd 1940 Model Marion 6 cylinder Buda—excellent condition  
One— $\frac{1}{2}$  yd Model 401 Keckring special clam and dragline combination  
One— $\frac{1}{2}$  yd Browning dragline and shovel combination—60' boom  
One—Bay City Model 20 shovel and shovel trailer— $\frac{1}{2}$  yd capacity  
One— $\frac{1}{2}$  yd Bay City Model 25 shovel and crane combination—35' boom  
One— $\frac{1}{2}$  yd Byers Gasolator shovel  
One— $\frac{1}{2}$  yd General crane—diesel powered—35' boom  
One— $\frac{1}{2}$  yd Insley Crawler Crane— $\frac{1}{2}$  swing—30' boom—gas powered  
One— $\frac{1}{2}$  yd P & H Crawler Model 200A—gas powered 40' steel boom—has  $\frac{1}{2}$  yd Blaw-Knox clam-shell bucket  
Two— $\frac{1}{2}$  yd General shovels  
One— $\frac{1}{2}$  yd Northwest Model 2 backhoe and shovel

### SHOVELS AND DRAGLINES

One— $\frac{3}{4}$  yd Byers dragline boom 34' including 5' removable section  
One— $\frac{3}{4}$  yd Model K-2 Bay City Shovel and dragline—35' boom  
One—Bucyrus-Erie 20-B all electric dragline—has necessary attachment to operate a bucket  
One—Bucyrus-Erie Model 1930— $\frac{3}{4}$  yd shovel and backhoe combination—it has  $\frac{3}{4}$  yd dipper bucket  
One—Byers "Bulldog" Crane dragline—35' boom and  $\frac{3}{4}$  yd Omaha dragline bucket and  $\frac{3}{4}$  yd shovel attachment  
One—Lorain Model 40— $\frac{3}{4}$  yd—has shovel attachments as well as crane boom 40' and  $\frac{3}{4}$  yd clam-shell bucket  
One— $\frac{3}{4}$  yd Meade-Morrison shovel  
One—Osmond crane with 50' boom Model Conqueror  
One— $\frac{3}{4}$  yd P & H Model 204—35' boom—has also a  $\frac{3}{4}$  yd shovel front  
One—P & H Model 400 crawler crane and shovel combination— $\frac{3}{4}$  capacity 38' boom camel back  
One— $\frac{3}{4}$  yd Bucyrus-Erie Model 19B shovel and dragline combination  
One— $\frac{3}{4}$  yd Keckring Shovel Model 303 crane and backhoe combination 60' boom—3 sections  
One— $\frac{3}{4}$  yd P & H Model 206 shovel  
One—Lorain 40— $\frac{3}{4}$  yd 1941  
One—1 yd Bucyrus-Erie Type GA combination shovel and 45' crane boom  
One—1 yd Erie Type B-2 steam shovel  
One—1 yd Bucyrus-Erie Model 1935 dragline—40' boom  
One—1 yd Byers Shovel  
One—1 yd Linkbelt K-1 crane—35' boom  
One—1 yd Lorain 60A Shovel  
One—1 yd Marion shovel and crane Model 7—45' boom  
One—1 yd Northwest crawler crane and shovel combination Model 105—40' boom, 50' boom  
One—1 yd Northwest Model 4 dragline 60' boom  
One—1 yd Osmond crane, shovel and backhoe combination—45' crane boom

★★

### MARCH SPECIALS on Shovels and Draglines

A few of the best buys—  
Northwest 6—1 $\frac{1}{2}$  yd shovel and dragline  
Keckring  $\frac{1}{2}$  yd Model 401 special clam and dragline  
1 $\frac{1}{2}$  yd Browning dragline and shovel 60' boom  
1 $\frac{1}{2}$  yd diesel shovel 1942 Bucyrus-Erie 37B  
Lorain 40— $\frac{3}{4}$  yd 1941  
Bay City 25— $\frac{1}{2}$  yd shovel 1938 model  
Lorain 30—1937— $\frac{1}{2}$  yd shovel, crane and backhoe combination

### SHOVELS AND DRAGLINES

One—1 yd P & H 450 gasoline crawler shovel—30' boom  
One— $\frac{1}{2}$  yd Bucyrus-Erie Model 35B steam shovel  
One— $\frac{1}{2}$  yd Keckring 1940 crane, dragline and shovel combination—35' boom  
One— $\frac{1}{2}$  yd Lima Model 601 crawler dragline 45' boom in two sections—gas  
One—Lima crane and shovel combination—60' boom  
One— $\frac{1}{2}$  yd Browning shovel and dragline combination—60' dragline  
One— $\frac{1}{2}$  yd Lima Crane and shovel combination—60' boom  
Two— $\frac{1}{2}$  yd Lorain Model 75B shovels  
One— $\frac{1}{2}$  yd Marion Electric shovel Model 400  
One— $\frac{1}{2}$  yd Osmond shovel, crane and dragline  
One— $\frac{1}{2}$  yd P & H Model 630 diesel shovel  
One— $\frac{1}{2}$  yd P & H Model 700 gas leading shovel  
One— $\frac{1}{2}$  yd Keckring Shovel Model 501—35' boom  
One— $\frac{1}{2}$  yd Linkbelt K-42—45' boom  
One— $\frac{1}{2}$  yd Linkbelt Model K gas—50' boom with fairleads  
One— $\frac{1}{2}$  yd Linkbelt crawler crane  
One— $\frac{1}{2}$  yd Linkbelt gas crane Model K-2—45' boom  
One— $\frac{1}{2}$  yd Lorain Model 75A gas shovel  
One— $\frac{1}{2}$  yd Marion steam shovel Model No. 32  
One— $\frac{1}{2}$  yd Marion Model No. 351 gas shovel or shovel and crane combination  
One— $\frac{1}{2}$  yd Marion Type 400 electric dragline  
One— $\frac{1}{2}$  yd Mastillon shovel with 60' boom  
One— $\frac{1}{2}$  yd Keckring Model 502 shovel with 75' boom  
One— $\frac{1}{2}$  yd Osmond crawler—30' boom  
One— $\frac{1}{2}$  yd P & H Model 600-A gas crawler crane—45' boom and 20' extension  
One— $\frac{1}{2}$  yd P & H Model 700 gas shovel  
One— $\frac{1}{2}$  yd Bucyrus-Erie Gas Air shovel and crane combination 45' boom  
One— $\frac{1}{2}$  yd Byers shovel and crane combination  
Two—Keystone Baco Shovels  
One— $\frac{1}{2}$  yd P & H Model 680 diesel  
Two— $\frac{1}{2}$  yd Lorain 75B diesel  
One— $\frac{1}{2}$  yd Linkbelt K-44 dragline—30' boom  
One—2 yd Bucyrus-Erie electric shovel and crane  
One—2 yd Bucyrus-Erie Model 30B steam shovel—35' boom  
One—2 yd Bucyrus-Erie steam shovel 45' boom with a 20' extension  
One—2 yd Marion Model 400 steam crane 70' boom  
One—2 $\frac{1}{2}$  yd Bucyrus-Erie dragline—60' boom  
One—2 $\frac{1}{2}$  yd Bucyrus steam shovel Model 70C  
One—2 $\frac{1}{2}$  yd Marion Type 123 electric shovel with 55' boom  
One—3 yd Bucyrus-Erie steam shovel Type 100B  
One—3 $\frac{1}{2}$  yd Bucyrus-Monaghan steam shovel and dragline 100' dragline boom  
Two—3 $\frac{1}{2}$  yd Marion electric draglines  
One—3 $\frac{1}{2}$  yd Marion steam shovel with turbine generator set and air jack hammer  
One—4 yd Bucyrus-Monaghan diesel  
One—4 yd Bucyrus steam shovel Model 100C 31' boom  
One—4 yd Marion electric shovel—34' boom  
One—5 yd Marion steam shovel Model 92B  
One—6 or 8 yd Bucyrus-Erie Model 228B  
One—6 $\frac{1}{2}$  yd Bucyrus shovel Type 320B—electric  
One—8 yd Bucyrus Model 352B steam 170' boom

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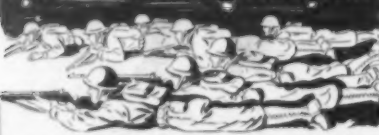
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### TESTED UNDER BATTLE CONDITIONS



#### LOCOMOTIVE CRANE

1—15-ton Bucyrus Erie locomotive crane, Serial No. 233, with 40' boom, steam powered. Equipped with air brakes. Thoroughly REBUILT. Cap. at a 12' radius and a 2 part line, 30,000 lbs. Boiler vertical size 54"x70". Shipping wt. 87,500 lbs.

#### AIR COMPRESSORS

Portable and stationary, belt with elec. or gas power, sizes from 20 cu. ft. to 1,000 cu. ft.

#### CRANES AND SHOVELS

1—1 1/4 yd. Link Belt Model K43 crawler crane, Serial No. 1253, with 40' boom, gasoline powered, and pull shovel attachment.  
1—1 1/4 yd. Erie gas air Model GA2, Serial No. 9758, with 45' boom and shovel attachment.  
2—1 yd. Northwest No. 4, Serial No. 3441, 3493, 60' booms.  
3—3/4 yd. Koehring cranes, Model 301, with 45' boom, Serial Nos. 544, 772 and 840. Gasoline powered.  
1—3/4 yd. P & H Model 400 crawler crane, Serial No. 4136, with 40' boom gasoline powered.  
1—1/2 yd. P & H shovel, Model 304, Serial No. 2303, gasoline powered.  
1—1/2 yd. Northwest No. 2, Serial No. 2008, comb. crane and shovel.  
1—3/4 yd. Erie Model B3 crawler crane, steam powered, Serial No. 4027, with 50' boom and shovel attachment.

#### CRUSHERS

1—9x9" Climax jaw crusher No. 2.  
1—9x24" United Iron Works jaw crusher "Blake Type".  
1—10x16" Buchanan jaw crusher.  
1—0x16" Acme jaw crusher No. 1686.  
1—12x20" Acme jaw crusher, No. 1873.  
1—7 1/2x13" Champion jaw crusher, No. 3.  
1—6x9" Holland jaw crusher, No. 9.

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All this equipment is owned by us and may be inspected at one of our plants.  
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U. S. Soldiers are tested under fire before they leave for the war front. E. C. A. construction equipment is tested under its own power before it leaves any of Equipment Corporation's rebuilding plants. It must pass by a wide margin because it is **GUARANTEED.**

#### DERRICKS

3—Steel Guy Derricks: 1—20-ton American steel Derrick, 110' mast, 109' boom; 1—5-ton Terry Guy Derrick, 70' mast, 60' boom; 1—5-ton Insley, 75' mast, 89' boom. Stiff leg derricks: 1—25-ton Hunter, 40' mast, 80' boom; 1—2-ton Pittsburgh, 25' boom, 15' mast. Also a number of wood stiff leg derricks, 1 to 5-ton cap.

#### HOISTS (Elec., Gas, Steam)

85—Electric, ranging from 20 H.P. up to 125 H.P., consisting of triple-drum, double-drum and single-drum, with AC or DC motors, some with attached swingers. Following makes: American, Clyde, Lambert, Lidgerwood and National.  
Gas hoists ranging from 8 to 120 H.P., single, double and triple-drum; all standard makes (38 in stock).

Steam, ranging from 8 H.P. to 60 H.P., single double and triple-drum; all standard makes.

#### PUMPS (Dredging)

1—10" Morris sand pump, Ser. No. 88864, cap. 87 cu. yds. per hr.  
1—5" Cataraft dredging pump, Ser. No. 175803, cap. 2000 GPM @ 55' head.  
1—8" Morris cent. sand pump, cap. 60 cu. yds. per hr.

#### PNEU. TOOLS

A large quantity of Jack hammer drills, column sized and derrick drills.

#### SHARPENERS (Bits)

1—Size J3 Ingersoll Rand bit sharpener No. 1626, for rock drill bits, power 3 H.P., G.E. electric motor, 220/440 volt, 60 cyl., 3 ph.  
1—Sullivan drill steel sharpener, Class A No. 556, air operated. Max. 1 1/2" round steel.

**EQUIPMENT CORPORATION**  
of **AMERICA.**

Modern Equipment for Contractors, Quarries, etc. See our advertisement last issue.

#### A. J. O'NEILL

Lansdowne Theatre Building  
Lansdowne, Pa.  
Phila. Phone: Madison 8300

#### ELECTRICAL MACHINERY

Motors and Generators, A.C. and D.C., for sale at Attractive Prices. Large Stock. New and Rebuilt. All fully guaranteed. Send us your inquiries.

V. M. NUSSBAUM & CO.  
FORT WAYNE, IND.

#### PULVERIZERS

One (1)—Sturtevant Vertical Emery Mill, new emery stones recently. Price \$875.00  
Four (4)—Kont Maxem Ring Ball Mills, in good running condition, may be seen in operation. Price, each, \$1675.00  
One (1)—Bradley 3 Roll Pulverizer. Price, \$1150.00

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32x18 Farrel Jaw Crusher Type B.  
32x18 Acme Jaw Crusher D-18.  
30x13 Farrel Reduction Jaw Crusher.  
24x12 No. 5 Champion Jaw Crusher.  
25x10 Acme Jaw Crusher.  
No. 13-A Telsmith Primary Gyrtatory Crusher.  
No. 38 Type 8 Kennedy Reduction Crusher with synchronous motor.  
No. 37 Type 8 Kennedy Reduction Crusher V-belt drive.  
No. 27 Standard Kennedy Reduction Crusher.  
No. 18 Standard Kennedy Reduction Crusher.  
42"x20" Traylor Heavy Duty Roll Crusher.  
30"x20" Kennedy Roll Crusher.  
25"x12" American Roll Crusher.  
5"x28" Traylor Heavy Duty Positive Drive Revolving Screen.  
5"x24" Traylor Trunion Drive Revolving Screen.  
48"x18" Telsmith Ajax Revolving Screen.  
30"x16" Acme Trunion Drive Revolving Screen.  
5"x10" Niagara Double Deck Vibrator Screen.  
42"x24" Telsmith Pulstar Double Deck Vibrator.  
42"x25" Link-Belt Single Deck Vibrator.  
70" Center 20" Belt Bucket Elevator—12-ply belt.  
80" Center 24" Chain Bucket Elevator—steel frame.  
70" Center 12" Chain Bucket Elevator—vertical.  
60" Center 12" Chain Bucket Elevator—vertical.  
40" Center 12" Chain Bucket Elevator—vertical.  
120"x36" Belt Conveyor complete with belt, frame and motor.  
140"x34" Belt Conveyor complete with belt, frame and motor.  
80"x12" Belt Conveyor complete with belt, frame and motor.  
30"x24"x12" Conveyor—any length.  
20 h.p. Leroy Gasoline Power Engine.  
Electric Motors from 1 to 300 h.p.  
60 Caterpillar Tractor with 5 yd. Swaper Wagon.  
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- 14—Trommel and Callow Screens
- 1—Reedy Hoist Elevator
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- 10—Bucket Elevators, 30' to 75' centers
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Everything priced for quick sale.  
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- 1—Vulcan 6' x 42" Rotary Dryer
- 4—Rotary Dryers, 4' x 30' to 6' x 64"
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Jaw crushers—9"x16", two 11"x20", 18"x32".  
Traylor 11" "BULLDOG" gyratory crusher.  
Robins double roll coal crusher, 24"x30".  
Sveinsson single roll coal crusher, 24"x30".  
Single roll coal crusher with spikes, 24"x24".  
Simplex coal pulverizer, type 33A.  
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Sturtevant No. 9 Rotary Fine crusher.  
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36"x175" trough belt conveyor equipment.  
14"x100" trough belt conveyor equipment.  
Selected lot of belt idlers and end pulleys.  
400' of 6-ply 36" conveyor belt.  
450' of 14" 6-ply conveyor belt.  
Large quantity of 14", 16" & 18" 4-ply belt.  
180' of 42" 8-ply conveyor belt.  
Single strand flight conveyors, 11" and 15".  
Steel plate conveyor, 45"x100" with flat surface.  
Jeffrey Foundry Mold conveyor, 42"x150".  
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Hand-propelled trippers for 24" & 36" belt.

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Enclosed 16" bucket-belt elevator, 120' high.  
Enclosed 12" bucket-belt elevator, 88' high.  
Enclosed 8" bucket-belt elevator, 50' high.  
Enclosed 6" bucket-belt elevator, 33' high.  
Open 16" bucket-chain elevator, 50' high.  
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New 9-ply rubber covered 22" elevator belt.  
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Gears, sprockets, elevator and drive chain.  
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Schramm 4 cyl. 360", V drive 69 h.p. AC motor.  
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2 Meyers stone saws, 60" & 48", 3 Lincoln planers.  
New York Air Brake 6B steam duplex air compressor.  
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Mercury 1 1/2 ton 30" gauge Edison battery locomotive.  
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Flat cars for 20" and 24" gauge.  
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The above locomotives are now being rebuilt for prompt delivery.

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Any quantity for 16-lb. to 60-lb. Rails.

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24"x48" McLanahan.  
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**22,000 GAL. STEEL TANK**  
On 50' Tower  
Excellent Condition

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All types and speeds

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Consisting of

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All in excellent condition and  
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2 Yd. Bucyrus Erie 50-B Electric Combination Shovel and Dragline. WARD LEONARD CONTROLS. Includes 2 yd. shovel bucket and 50 ft. dragline boom with fairleads.

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#### MISCELLANEOUS ITEMS

Barges, Bins, Buckets, Rollers, Cableways, Cars, Compressors, Conveyors, Cranes, Dryer, Derricks, Elevators, Excavators, Generators, Hoists, Kilns, Draglines, Drag Scrapers, Dredges, Drills, Engines, Locomotives, Loaders, Motors, Pipe, Pumps, Rail, Seales, Screens, Slacklines, Shovels, Tanks, Trucks, Tractors, Etc., in many sizes, types and makes at low prices. (I have equipment at many points in the United States and Canada. What you need may be near your plant.)

#### ALEXANDER T. McLEOD

7229 Rogers Avenue CHICAGO

### FOR SALE

- 1—Crushing Plant consisting of 36 x 42 Farrel Jaw Crusher, Belt Conveyor, Secondary Crusher, Revolving Screen, Elevators, Five Vibrating Screens, Motor Air Compressor, Barber-Greene Loaders, Well Drills, Diesels and Parts.
- 1—16" Telsmith Gyratory Crusher.
- 1—26" Telsmith Gyratory Crusher.
- 1—48" Telsmith Gyratory Reduction Crusher.
- 1—32" Telsmith Gyratory Reduction Crusher.
- 1—6" Allis Chalmers Gyratory Reduction Crusher.
- 1—27" Kennedy Gyratory Reduction Crusher.
- 1—22 x 56 Good Road Jaw Crusher.
- 1—18 x 36 Buchanan Jaw Crusher.
- 1—18 x 36 Farrel Jaw Crusher.
- 1—24 x 36 Traylor Jaw Crusher.

#### BLUE BALL MACHINE WORKS

BLUE BALL, PA.

### FOR SALE

Beaver Super Tamper—Molds to make 4", 6", 8", 1 1/2" wide blocks, both 16" and 18" long.  
Beaver 42 Cubic Ft. Mixer.  
7600 Steel Pallets 12"x15".  
Stripper Lintel Machine.  
Trico Hammer Mill.  
2080 Steel 6 x 16 two-core Pallets.  
Priced for Quick Sale.  
H. H. LONGENECKER  
Primos, Delaware County, Pa.

### FOR SALE OR RENT

1/2 yd. Bucyrus Crane—Clamshell—Dragline.  
1 yd. Northwest Crane—Clamshell—Dragline.  
1 1/2 yd. Marion Shovel—Diesel.  
1,000,000 Ton Strip Coal Mine in Illinois.

#### A. W. NEVERS

Mt. Pleasant, Iowa Phone 32

### SHOVELS—CRANES

Quand "Chief" 2 yd Shovel, gas.  
P. & H. 600 Shovel, Crane & Dragline.  
P. & H. 8-Ton Truck Crane on Mack Truck.  
Pack.  
Speeder 1/2 yd Shovel & Crane, gas.  
Moore Speedcrane, 15 tons, gas, 65' bn.  
Bucyrus Erie Model 1039 Electric Tunnel Shovel.  
Bucyrus Erie 50B Steam Crane, 160' boom.  
Buc. Erie 1 yd Steam Crane, excellent.  
Buc. Erie Steam Dragline, 6 to 8 yd. bucket.  
Northwest Model 104 Shovel-Crane, 1 1/4 yd.  
Northwest Model 105 Shovel-Backhoe, 1 yd. Rbt.  
Northwest Model 105 Crane, 1 yd. Rbt.  
Koehring 301, 1/2 yd. Crane and Shovel.  
Brownhoist 7 1/2 ton Gas Crane.  
Ind. Brownhoist 10-ton Cal. Crane, gas.

### TRACTORS AND MISCELLANEOUS

Caterpillar D6 Tractor with bulldozer.  
Cletrac FD Tractor with 12 yd. Hell Scraper Wagon.  
TD9 Tractor with Shovel Front and Bulldozer.  
Allis-Chalmers L Tractor with Baker Bulldozer.  
Bucket Elevator, vertical, 40', 24' buckets.  
Banness 24E Dual Drum Faver. Excellent.  
I.R. two stage, 315 CFM. Portable Compressor.  
6—I.R. Wagon Drills.  
4—Gardner-Denver Wagon Drills.  
6—Spencer Dust Collectors, equal to new.  
2—Mack Trucks 6BX, Boulder type, 12 yds.  
2—Sterling Trucks 170-C, Boulder type, 12 yds.  
1—International Truck, 12 yds. Boulder type.  
Steel stiff-leg Derrick, 35-ton, 100' bn. Excellent.  
2—Steel Stiff-leg Derricks, 10 tons, 100' bn.  
Hardinge Conical Ball Mill, 4 1/2' x 16".  
Allis-Chalmers Cent. Pump, electric, 3500 GPM.  
Worthington 8" cent. Bronze impeller, elec. port.  
Dredge Pump 10" F. H. cent., nearly new.  
Kennedy Van Saun Revolving Screen 4' x 18', almost new.

### CONCRETE PLANT AND EQUIPMENT

Helical 35-ton 3 compst. Steel Bin-batcher.  
Rex 288 Mixer on skids, almost new.  
Bulk Cement Bin, 350 bbls. Complete.  
Blaw-Knox 3 compst. 100-ton Aggregate Bin.  
B.K. 50-ton, 2 compst. Bin with weigh batcher.  
Fuller Kinross Bulk Cement Unloader, portable.  
Fuller C40 Rotary Air Compressor, electric.  
Rex Pumpcrete Model 200 with 750' pipe.  
Rex Pumpcrete Model 100 with pipe.  
Rex Pumpcrete Model 160 with 500' pipe.  
Banness 27E Dual Paver with boom and bucket.

### CRUSHERS—CRUSHER PLANTS

Telsmith 20-B steel frame Gyratory, V-belt drive.  
Gyratory Crusher: K.V.S. 30, 37-8, 49, 32, 8A, 8B; Traylor 8"; McCully 13", 8", 6".  
Allis-Chalmers Anconada Type, 54"x14".  
Jaw: 6x12, 9x16, 10x20, 14x24, 12x26, 12x30, 16x32, 56x34.  
Complete Rock Crushing Sand & Gravel Plants.

### BUCKETS—STONE SKIPS

Owen 1 yd. Clamshell, rehandling.  
Blaw-Knox 1/2 yd. Clam. digging.  
Hayward 1/2 yd. Clam. digging.  
1/2-yd. Williams Clamshell, digging.  
2—1/2-yd. Hales rehandling, Clamshell.  
1/2-yd. Hales Clamshell, rehandling.  
1/2-yd. Clamshell, rehandling.  
Owen Stone Grapple.  
Hayward 1/2-yd. Standard Orange Peel.

### LOCOMOTIVES—CARS

American 60-ton, steam, std. ga.  
American 50-ton, steam. Saddle Tank.  
American 45-ton, steam. Saddle tank.  
Davenport 16-ton, Std. gauge, gas.  
Whitcomb 14-ton Diesel, 36" gauge.  
Vulcan 8-ton, std. gauge, gas.  
Vulcan 6-ton, gas, 36" gauge.  
Porter 12-ton Saddle Tank, Steam 36" ga.  
21—Koppel, 4 yd. 36" gauge Dump Cars.  
6—40-ton Standard Gauge Flat Cars.

#### RICHARD P. WALSH CO.

30 CHURCH STREET NEW YORK

27-E Smith Paver, Model H-31.  
Hayward 2 Yd. Orange-Peel Bucket.  
1/2 Yd. Model 400 P & H Shovel.  
1 Yd. Link-Belt K-36 Shovel.  
1 Yd. Northwest 105 Shovel-Crane.  
10 ton Buf-Spr. Roller, Gas, 3 Wh.  
8 ton Buf-Spr. Roller, Gas, 3 Wh.  
Gardner-Denver Loader, Model GD-9.  
5—Electric Hoists, 40, 50 and 60 H.P.  
Gard-D. Compressor, 630" A.A., E. Dr.  
1 Yd. Round Shaft Buckets.  
1 Yd. and 1/2 Yd. Dump Buckets.  
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Shovel Attachment for 41-B Bucyrus-Erie.  
McK-T Pile Hammers, 2, 3, 5, 6 and 7.

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600 Cast Iron Pallets  
8x12x16  
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Reese Road Battle Creek, Michigan

### OUTSTANDING VALUES

20 Yd. Electric Crawler Dragline.  
20 Yd. Electric Crawler Stripping Shovel.  
85 and 150 HP. 125 Lb. HRT Rollers.  
35 HP Clyde 2 Drum & Swinger Gase. Hoist.  
1—1 1/4 Yd. 50' boom, series 1.500 Speedcrane.  
1,500 CFM Syn. M.D. Sullivan Air Compressor.  
Caterpillar "60" Diesel Tractor & Bulldozer.  
MISSISSIPPI VALLEY EQUIPMENT CO.  
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Belting...Elevator Belting...Fire,  
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RUBBER HEADQUARTERS

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NEW, GUARANTEED & LOW PRICED**

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**ABRASIVE RESISTANT COVERS**

Width	Ply	Top-Bottom	Covers	Width	Ply	Top-Bottom	Covers
48"	8	1/8"	1/16"	20"	5	1/8"	1/32"
42"	5	1/8"	1/16"	20"	4	1/8"	1/32"
36"	6	1/8"	1/16"	18"	4	1/8"	1/32"
30"	6	1/8"	1/16"	16"	4	1/8"	1/32"
30"	5	1/8"	1/16"	14"	4	1/16"	1/32"
24"	5	1/8"	1/32"	12"	4	1/16"	1/32"
24"	4	1/8"	1/32"				

Inquire For Prices - Mention Size and Lengths

**TRANSMISSION BELTING**

**HEAVY-DUTY FRICTION SURFACE**

Width Ply	Width Ply	Width Ply
18" - 6	10" - 6	6" - 5
16" - 6	10" - 5	5" - 5
14" - 6	8" - 6	4" - 5
12" - 6	8" - 5	4" - 4
12" - 5	6" - 6	3" - 4

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"A" WIDTH All Sizes "D" WIDTH All Sizes  
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Size	Length	Per Length
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	25 "	13.00
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Specify Thread On Couplings

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Guaranteed used Steel Pipe  
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Cheap.

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- 1-Derrick (wood) 70' Mast—70' Boom with caps, fittings, etc., and bull wheel—2 double blocks 3 single blocks for above.  
2250' 1 1/4" Wire Rope (used in 9 guy wires)  
700' 3/4" Wire Rope (hoist)  
390' 3/4" Wire Rope (hoist)
- 1-Derrick (wood) 45' mast—35' boom with caps, etc.  
2 double blocks—2 single blocks  
800' 1 1/4" wire rope (used in 8 guy wires)  
450' 3/4" wire rope (hoist)
- 1-Double drum hoist, belt connected to 40 H.P. Waukesha hoisting motor—installation mounted on skids for portability.
- 1-Ingersoll Rand Portable Air Compressor direct connected to 4 cyl. Waukesha motor.  
160' 1 1/4" galvanized iron pipe for air line.  
80' 1 1/4" galvanized iron pipe for air line.
- 1-Rex centrifugal pump with Wisconsin motor (self-priming)
- 1-5" Centrifugal Pump, powered by Ford V-8 motor  
25' 5" galv. iron pipe  
200' 4" galv. iron pipe  
90' 3" galv. iron pipe
- 1-45 lb. jack hammer with 50' 3/4" rubber hose.
- 1-Steel buckets for hoisting ore out of quarry.
- 1-Dynamite House.
- 1-Tool House  
Miscellaneous small tools, etc., approx. as follows:  
18 vva. Goggles  
2 Axes  
3 Picks  
3 Sledge Hammers  
1 Shop Hammer  
3 Pipe Wrenches  
1 Cross Cut Saw  
1 Hand Saw  
12 Shovels  
12 Drill Bits  
1-6" Drill Steel  
1-6" Drill Steel  
2-5" Drill Steel  
1-4" Drill Steel  
1-3" Drill Steel  
2-2" Drill Steel  
3 Gallons Jack Hammer Oil  
1-Level  
1-Square  
Miscellaneous lot office equipment approx. as follows:  
1-only Royal Typewriter  
1-only Filing Cabinet  
1-only Storage Cabinet  
1-only Gas Stove

For further information regarding this equipment, write, wire or phone G. E. Chesnut, local representative Meramec Minerals, Inc., Llano, Texas; or Meramec Minerals, Inc., 723 Hanna Building, Cleveland, Ohio.

**MERAMEC MINERALS, INC.**

(Basic Refractories, Inc.)

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**NEW**

Raymond Bowl Mills for sale. One No. 493 Bowl mill with separate feeder, piping, and electrical control board. Rated capacity for use as a unit pulverizer grinding coal, 10,250 lbs.-11,150 lbs. per hour. One No. 493 Bowl mill with separate feeder, piping, and electrical control board. Rated capacity for use as a unit pulverizer grinding coal, 12,900 lbs.-14,100 lbs. per hour.

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Osborn,

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**4**

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### AIR COMPRESSORS

BELTED: 355, 528, 670, 1090, 1390 & 1570 Ft. Electric: 478, 576, 807, 1202, 1723 & 2309 Ft. DIESEL: 603, 807 & 1000 Ft. PORTABLE GAS: 110, 100, 230, 310, 540 & 1390 Ft. STEAM: 49, 310, 528, 1300, 2300 & 3600 Ft. CLAMSHELL BUCKETS, SKIPS & GRAPPLERS Owen R & H Stone Grapplers. 2 Yd. OWEN Type 3 Material Handling. 1 1/2 Yd. 1 Yd. & 1/2 Yd. HAYWARD Class R. 18 Steel Skips 6 1/2 x 6 x 2 1/2. 5 Ton Bucyrus Rock Grabs.

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1-16 Yd. 160' Boom Electric Caterpillar Dragline. 1/2 Yd. 5 Ton O & S 30 Ft. Boom. 12 Ton NORTHWEST 50 Ft. Boom Gas. 20 Ton LIMA, 750 Diesel, 85 Ft. Boom. 25 Ton BROWNING & 32 Ton AMERICAN Loco. 25 Ton LINK BELT R-48 Electric, 70 Ft. Boom.

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1/2 Yd. Lima Diesel. 2 Yd. Marion Steam Shovel. 1 Yd. 1 1/2 Yd. & 2 Yd. MARION Electrics. 1 Yd. NORTHWEST Gas. 1 1/2 Yd. LIMA Diesel. 1 1/2 Yd. BUOYRUS 41B Steamer. 4 Yd. Bucyrus 120 B Electric. 20 yd. Erie Elec.

### DUMP CARS

40-KOPPEL 1 1/2 Yd. 24 & 30 In. Ga., V Shaped. 15-3 Yd. 3 Yd. 4 Yd. 6 Yd. 12 Yd. 30 In. Ga. 30-Std. Ga. 12 Yd. 18 Yd. 20 Yd. & 30 Yd. Cap. 15-Std. Ga. 50 Ton Battleship Gondolas.

### FLAT CARS

9-50 ton std. ga. heavy duty flat cars.

### HOISTING ENGINES

Gas: 15, 30, 60, 100 & 120 HP. Electric: 30, 52, 80, 100 & 150 HP. Steam: 6 1/2 x 8, 7 x 10, 8 1/2 x 10, 10 x 12, 12 x 24.

### DIESEL UNITS

75, 90, 180, 200 HP. P. M. Engines. 110 HP Ingersoll Rand Engine. 175 KVA Worthington 3/60/2300. 275 KVA Fairbanks 3/60/2300.

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5'x22" HARDINGE CON. Dry Ball Mill. 6'x22" HARDINGE CON. Pebble Mill. 8'x22" HARDINGE CONICAL Ball or Pebble Mill. 4x8, 8x8 & 10x9 Straight Ball Mills. 4x10, 5x10 & 6x12 Tube Mills & 6'x22". 2 1/2 x 8 & 3 1/2 x 8 Air Sweep Tube Mills. 2 1/2 x 4, 3x4 & 5x12 MOD. MILLS.

### PULVERIZERS

JEFFERY, 24x30 & No. 1 Sturtevant Ring Roll. RAYMOND Auto Pulveriser No. 0000, 0 & 3.

### STEEL STORAGE TANKS

10,000 Gal., 15,000 Gal. & 20,000 Gal. Cap.

### SEPARATORS AND COLLECTORS

8, 10 and 14 ft. Separators, Gavco & Bradley.

### ROLL CRUSHERS

36x60 Fairmount & 36x30 Diamond.

### JAW CRUSHERS

10x8, 12x7 1/2, 14x7, 15x9, 15x10, 16x9, 16x12, 16x10, 18x11, 20x8, 20x8, 20x10, 20x12, 20x13, 30x15, 30x15, 30x15, 30x30, 30x18, 30x14, 36x9, 36x6, 36x16, 36x24, 42x9, 48x24, 48x36, 60x42, 84x66, 36x16, 92x66.

### CONE & GYRATORY CRUSHERS

5 No. 10, 25, 37 & 49 Kennedy. 18 in. 24 in., 30 in., 36 in. & 48 in. Symons Disc. 4-18 7 1/2 Traylor 4 ft. Gyratory. 4-No. 5, 1 & 2 Austin Gyratory. 2-Traylor T-12 Bulldog Gyratory, also 18 inch 8 in. Traylor T. Gyratory. 17 Gates K-No. 5, 4, 5, 6, 7 1/2, 8, 9 1/2 & 21. 10 inch Austin Model 105. 6, 10 & 13 inch Superior McCullys.

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BELT: 1000 Ft. 60 in., 700 Ft. 40 in., 600 Ft. 36 in., 500 Ft. 30 in., 1042 Ft. 24 in., 517 Ft. 20 in., 297 Ft. 18 in., 500 Ft. 16 in., 300 Ft. 14 in. IDLERS: 54 in., 42 in. 30 in., 30 in., 24 in., 30 in., 18 in., 16 in. & 14 in. Head & Tail-Pulleys-Takeup for all sizes. Steel Frames: 2,000 Ft. 24 in., 30 in. 436 in. Sections.

### ROTARY DRYERS AND KILNS

88 in. x 20 Ft., 3 Ft. x 20 Ft., 5 Ft. x 20 Ft., 54 in. x 20 Ft., 42 in. x 24 Ft., 5 Ft. x 20 Ft., 5 Ft. x 16 Ft., 6 Ft. x 20 Ft., 6 Ft. x 10 Ft., 16x30, 7 1/2 x 100 & 8 x 110 Ft. Kilns.

### STEEL DERRICKS

GUY: 8 Ton 85 Ft. Boom, 15 Ton 100 Ft. Boom, 30 Ton 115 Ft. Boom, 50 Ton 100 Ft. Boom. STIFF LEG: 5 Ton 70 Ft. Boom, 15 Ton 100 Ft. Boom, 25 Ton 100 Ft. Boom, 75 Ton 135 Ft. Boom.

### LOCOMOTIVES

GASOLINE: 3 Ton, 5 Ton, 8 Ton, 12, 14, and 30 Ton. STEAM: 9 Ton, 30 Ton, 40 Ton, 60 Ton & 80 Ton. ELECTRIC: 2 Ton, 5 Ton, 8 Ton, 40 Ton. DIESEL: 4, 8 & 15 Ton.

### SCREENS

VIBRATING 2x4, 2x8, 12x8, 2x8, 2x5, 4x5, 4x8, 4x10, 4x12, & 4x12. 1, 2 & 3 Deck. HUMMER, HOPKIN, NIAGARA & HOBINS. REVOLVING: 3x12, 3x18, 8 1/2 x 15, 2x24, 4x16, 4x20, 4x30, 4x34, 5x30, 5x30, 6x30.

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COMPLETE PLANTS BOUGHT AND SOLD  
60 East 42nd Street  
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One-four-year-old Super-K 3 Besser Tamper. One-forty-foot Besser Mixer, complete with skip-hoist. All necessary attachments, pallets and racks to be sold with machine.

### BUILDING UNITS, INC.

1800 Bayard Street Baltimore, Maryland

## EQUIPMENT WANTED

## WANTED

1-Jaw Crusher — Approximate size 30" x 40" finished product 3 1/4".

1-Ross Feeder.

1-Inclined Elevator — 50' — C. C. Chain or Belt Capacity 150 T. P. H. 4" stone.

1-Hammermill — Pennsylvania Preferred, Capacity 25 T. P. H. Minus 20 mesh.

1-Enclosed Elevator—60' C. C. Capacity 50 T.P.H. (fine stone).

1-4' x 10' Tyler Hummer Screen —Complete with Vibrators and Generator.

1-Feeder — Jeffery — Traylor No. 4 preferred.

1-Bin — Capacity approximately 200 tons stone, with conical bottom.

1-Bin — Capacity approximately 400 tons stone, with conical bottom.

2-Slip Ring Motors—125-150 H.P. 1200 R.P.M. 440 V.—60 C.

1-Motor Gear Reducer—20 H.P. —440 V.-60 C.

1-Motor Gear Reducer—7 1/2 H.P. —440 V.-60 C.

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THOMASVILLE, PENNA.

## WANTED

Need 4-6 yard Dragline with 150 foot Boom or other machine capable of stripping 65 feet of dirt. Prefer to rent over a period of three to five years. Write or Wire B-55, c/o Rock Products, 309 W. Jackson Blvd., Chicago 6, Ill.

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Consulting Engineer

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### MINERAL COLORS

## CEMENT-PLASTER-STUCCO CONCRETE PRODUCTS

"FINE BECAUSE OF THEIR FINENESS"

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HENRY, VIRGINIA

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Raymond Mill, 5 roll, 2 crushers, rotary dryer, 6'x50", motors, elevators, screens, etc. Large bins. Good Bldg. on R.R. Siding. Located near Los Angeles, Calif. Now operating. Will fine grind or make granules of talc, barytes, bentonite, clays, magnesite, phosphate rock, sulphur, limestone, many others. Prefer sell as unit.

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Complete Stone Crushing and Agri-Lime Pulverizing Plant. A well established business of 25 years. 15000-Tons Agri-Lime and unlimited amount of crushed stone to get out. Reason for selling . . . Age and poor health.

### S. ELIZABETH HEMPY

Rushsylvania, Ohio Logan County

For Sale: At a sacrifice, on account of health. Complete products plant, equipped to make concrete stave silos, building blocks, fence posts and burial vaults. Money Maker.

### The Gallen Concrete Tile Co.

Gallen, Michigan

## POSITIONS WANTED

OPEN PIT MINING SUPERINTENDENT, high school education plus home study to qualify as mechanical engineer. 8 years general machinist, 20 years master mechanic, superintendent and general superintendent of non-metallic mining and refining operations. Experience covers dry dirt moving power shovels, carryalls, industrial railroad. Hydraulic mining both suction and dipper dredges. Refining experience covers various water washing, pulverizing, and air-flotation equipment. Chemical in general mine office including purchasing and freight traffic. Available 30 days. Write Box B-54, c/o Rock Products, 309 W. Jackson Blvd., Chicago, Illinois.

## POSITIONS VACANT

Wanted: Assistant chemist in Midwest cement plant. State training, experience, if any; draft status. Give references you may have. Write Box B-53, Rock Products, 309 W. Jackson Blvd., Chicago, Illinois.

## WANTED

Quarry foreman—shovel operation —\$ men—permanent position—salary and profit sharing.

### JERSEY QUARRY COMPANY

JERSEYVILLE, ILL.

## CEMENT CHEMIST

Wet process cement plant in Southwest has opening for Cement Analyst and Research Chemist. Good educational background necessary. In application give complete information on age, education, work record, marital status, draft classification and salary expected. Box B-56, c/o Rock Products, 309 W. Jackson Blvd., Chicago, Illinois.

# STAUNCH



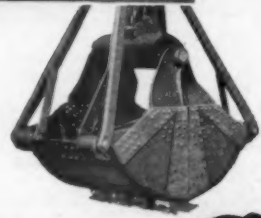
Through demonstrated dependability servicemen have come to place implicit confidence in the ever faithful and efficient American Red Cross.

Through long demonstrated performance, too, bucket users have come to depend with confidence upon Owen Buckets as the most rugged and dependable units available to meet their various important requirements.

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BRANCHES: New York, Philadelphia, Chicago, Berkeley, Cal.



# OWEN BUCKETS

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## How a bad connection led to a good one

Every time I see pictures of those Jeeps bouncing across the country I'm reminded of the ride I took with Samson in his old Model T. It was back in '15: Samson was Super at a cement quarry in Illinois, and I was busy with Cordeau-Bickford, the original detonating fuse. He had



*I went along the trunk line*

wired me to drop everything and come out. "... and bring a union," were his closing words.

We were hitting the back road — hitting the high spots, fast! "What's the hurry?" I gasped.

"I got a hill full of dynamite an' a brand new shovel eatin' her head off," he replied. "We have about 30 feet of good cement rock along here," he added, as we slid to a stop, "but we can't keep ahead of the shovel with just one row, so I decided to sink some more holes. Finished loading night before last — our first Cordeau hook-up. We shot yesterday, and the only thing it did was

blow up the cap!"

From where we stood I could see a network of Cordeau: a double row of holes with slit-wrap connections at each hole. I went along the trunk line, making sure that the branch line connections were tight and led off at right angles to the trunk. When I came to the end of the line nearest the face I noticed that it was fused and blackened, so I cut the end off square and clean.

Samson handed me an electric cap and I connected it onto the end of the trunk line with our Special Union — I always took some along when I went on these trips. Then, while he moved the car I ran the wires over the hill to the battery. When all was ready we set off as pretty a blast as you ever saw.

"Let's see one of those unions!" said Samson later, as the train was pulling into the station. "... Yeah

... I guess laying the cap and Cordeau cross-wise under a rock wasn't such a hot idea! ... It generally pays to follow the manufacturer's recommendation.

"Well, so long ... and thanks for the union — and the check-up!" he added with a grin, as I swung aboard.

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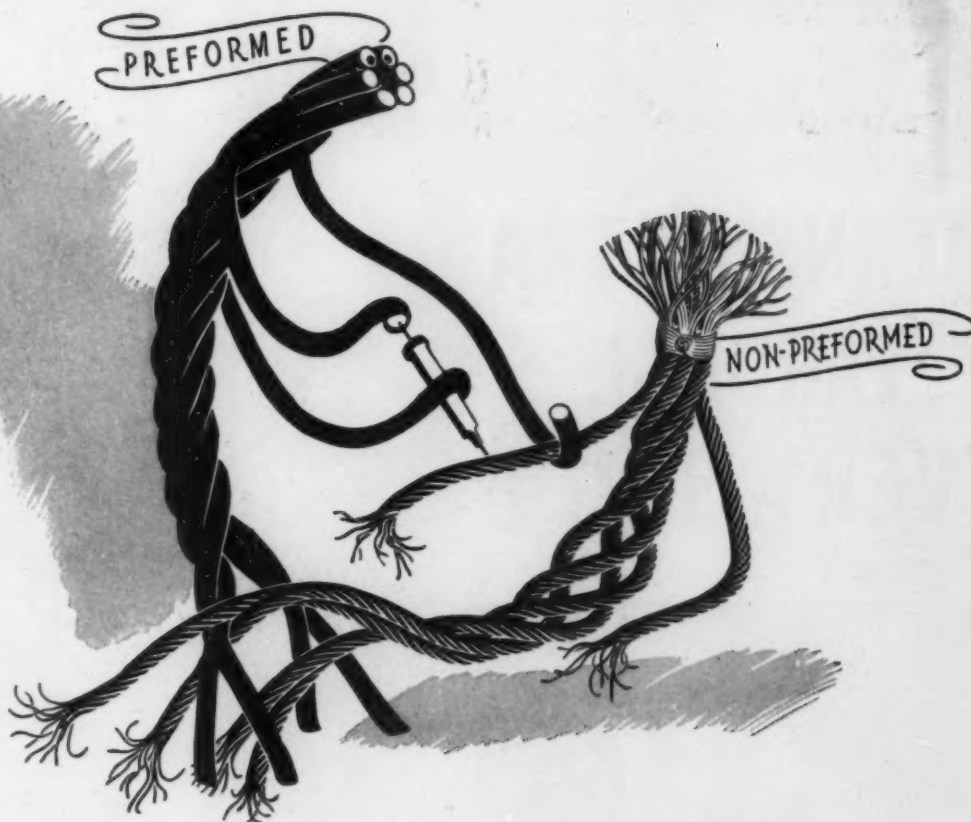
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